Vol. 886 Number 3

OFFICIAL GAZETTE

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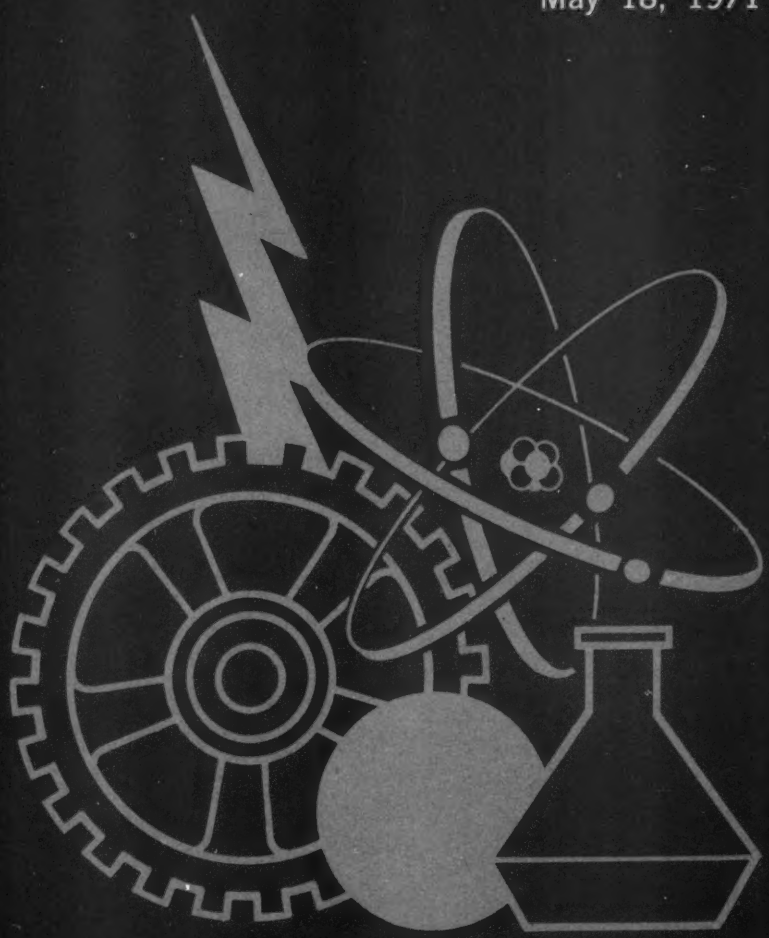
PATENTS

May 18, 1971



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Patent Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

May 18, 1971 Volume 886 Number 3

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PATENT OFFICE NOTICES

Appeal Briefs Under Rules 192 and 193(b)

Appellants are reminded that their briefs in appealed cases must be responsive to every ground of rejection stated by the examiner, including new grounds stated in his answer.

Where an appellant fails to respond by way of brief or reply brief to any ground of rejection, and it appears that the failure is inadvertent, appellant shall be notified that he is allowed one month to correct the defect by filing a supplemental brief. Where this procedure has not been followed, the Board of Appeals should remand the application to the examiner for compliance. When the record clearly indicates intentional failure to respond by brief to any ground of rejection, for example, by failure to file a supplemental brief within the one-month period allowed for that purpose, the examiner should inform the Board of Appeals of this fact in his answer and merely specify the claims affected.

Where the failure to respond by brief appears to be intentional, the Board of Appeals may dismiss the appeal as to the claims involved. Oral argument at a hearing will not remedy such deficiency of a brief.

This notice supersedes the notices of May 4, 1966, 826 O.G. 1060, and of Oct. 20, 1966, 833 O.G. 1.

WILLIAM E. SCHUYLER, JR.,
Apr. 26, 1971. *Commissioner of Patents.*

TITLE 37—PATENTS, TRADEMARKS, AND COPYRIGHTS

Chapter I—Patent Office, Department of Commerce

PART 1—RULES OF PRACTICE IN PATENT CASES

PART 3—FORMS FOR PATENT CASES

Conflicting Claims

These rule changes are intended to provide: (1) a basis for requiring a determination of priority without an interference by the common owner of a plurality of applications, or patent and applications, containing conflicting claims, and (2) a basis for requiring inclusion of a common ownership clause in all terminal disclaimers filed to obviate a double patenting rejection.

The proposal to amend Title 37, Code of Federal Regulations, by revising §§ 1.78 and 1.321 and by adding a new § 3.53 was published in the December 31, 1970, issue of the Federal Register (35 F.R. 20011).

All interested persons were given an opportunity to participate in the rule making process by submission of comments in writing and in person at an oral hearing held on February 19, 1971. Changes have been made in the text of the original proposal as a result of these comments.

In consideration of the comments received and pursuant to the authority contained in section 6 of the Act of July 19, 1952 (66 Stat. 793; 35 U.S.C. 6), Parts 1 and 3 of Title 37, Code of Federal Regulations, are hereby amended as follows:

1. In § 1.78, paragraph (b) has been revised and paragraph (c) has been added to read as follows:

§ 1.78 *Cross-references to other applications.*

* * * * *

(b) Where two or more applications filed by the same applicant contain conflicting claims, elimination of such claims from all but one application may be required in the absence of good and sufficient reason for their retention during pendency in more than one application.

(c) Where two or more applications, or an application and a patent naming different inventors and owned by the same party contain conflicting claims, the assignee may be called upon to state which named inventor is the prior inventor. In addition to making said statement, the assignee may also explain why an interference should be declared or that no conflict exists in fact.

2. Section 1.321 is revised to read as follows:

§ 1.321 *Statutory disclaimer.*

(a) A disclaimer under 35 U.S.C. 253 must identify the patent and the claim or claims which are disclaimed, and be signed by the person making the disclaimer, who shall state therein the extent of his interest in the patent. A disclaimer which is not a disclaimer of a complete claim or claims may be refused recordation. A notice of the disclaimer is published in the OFFICIAL GAZETTE and attached to the printed copies of the specification. In like manner any patentee or applicant may disclaim or dedicate to the public the entire term, or any terminal part of the term, of the patent granted or to be granted.

(b) A terminal disclaimer, when filed in an application to obviate a double patenting rejection, must include a provision that any patent granted on that application shall be enforceable only for and during such period that said patent is commonly owned with the application or patent which formed the basis for the rejection. See § 1.21 for fee.

3. A new § 3.53 is added, which reads as follows:

§ 3.53 *Terminal disclaimers in applications.*

To the Commissioner of Patents:

Your petitioner, ----------, residing at ---------- in the county of ---------- and State of ---------- represents that he is (here state exact interest of the disclaimant and, if he is an assignee, set out the liber and page or reel and frame where the assignment is recorded) of application Serial No. ----------, filed on the ------ day of ----------, 19--- for ----------. Your petitioner, ----------, hereby disclaims the terminal part of any patent granted on the above-identified application, which would extend beyond the expiration date of Patent No. ---------- and hereby agrees that any patent so granted on the above-identified application shall be enforceable only for and during such period that the legal title to said patent shall be the same as the legal title to United States Patent No. ----------, this agreement to run with any patent granted on the above identified aplication and to be binding upon the grantee, its successors or assigns.

Effective date. This revision shall become effective on April 30, 1971.

WILLIAM E. SCHUYLER, JR.,
Commissioner of Patents.

Approved: April 12, 1971.
JAMES H. WAKELIN, JR.,
Assistant Secretary for Science and Technology.

[FR Doc. 71-5418; Filed 4-16-71; 8:51 am]

Published in 36 F.R. 7312; Apr. 17, 1971

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,809,602, Zimmerley and Malouf, EXTRACTION OF RHENIUM INCIDENTAL TO MANUFACTURE OF MOLYBDENUM OXIDE, **filed** Dec. 8, 1970, D.C. Colo. (Denver), Doc. C-2763, *Kennecott Copper Corporation* v. *The S. W. Shattuck Chemical Co., Inc. and Engelhard Minerals and Chemical Corporation.*

2,828,449, I. L. Kerper, SAFETY FEATURE FOR ELECTRIC WATERTIGHT DOOR SYSTEMS, **filed** Dec. 11, 1970, D.C., C.D. Calif. (Los Angeles), Doc. 70-2777-F, *Irving L. Kerper* v. *Grace Line, Continental Equipment Corp. et al.*

2,895,003, G. M. Rapata, STRAIN RELIEF GROMMET; **2,930,840**, F. Klumpp, Jr., STRAIN RELIEF BUSHING, **filed** May 12, 1967, D.C., N.D. Ill. (Chicago), Doc. 67c801, *Heyman Manufacturing Company* v. *Richlock Corporation et al.* Order on stipulation, dismissed and judgment by consent, Dec. 4, 1970.

2,907,585, Sornberger and Wakeman, MANIFOLDING ASSEMBLIES, **filed** Aug. 6, 1968, D.C., S.D. Fla. (Miami), Doc. 68–934–TC, *Moore Business Forms, Inc.* v. *Gulfstream Press, Inc.* Judgment by consent, patent valid and infringed by defendant. Defendant's counterclaim dismissed with prejudice, Nov. 18, 1970.

2,930,840. (See 2,895,003.)

3,045,910, H. M. McLearn, AUTOMATIC COUNTING MACHINE, **filed** Dec. 3, 1970, D.C., N.D. Fla. (Jacksonville), Doc. 70–249–Orl–C, *American Machinery Corporation* v. *FMC Corporation.*

3,096,048, P. E. Yost, HEATED GAS GENERATOR FOR BALLOON; **3,131,889,** same, BALLOON STRUCTURE WITH RELEASE MECHANISM; **3,229,932,** same, MANEUVERING VALVE FOR HOT AIR BALLOON, **filed** Dec. 17, 1970, D.C., C.D. Calif. (Los Angeles), Doc. 70–2841–DWW, *Raven Industries, Inc.* v. *Donald L. Piccard.*

3,111,991, Luger and Luger, SECTIONAL BOAT STRUCTURE, **filed** Nov. 18, 1970, D.C. Minn. (Minneapolis), Doc. 4–70–C–497, *Luger Industries, Inc.* v. *Commodore Kits and Donald Simerson.*

3,131,889. (See 3,096,048.)

3,146,319, W. O. Stanton, MAGNETIC PHONOGRAPH PICKUP WITH COMPENSATING POLE PIECE ARRANGEMENT; **3,297,831,** same, MAGNETIC STEREOPHONIC PHONOGRAPH PICKUP, **filed** Oct. 8, 1970, D.C., S.D.N.Y., Doc. 70–C–4372, *Pickering & Company Inc.* v. *Qualitone Industries, Inc.* Consent order, defendant perpetually enjoined, Dec. 7, 1970.

3,150,216, W. Z. Salcer, METHOD FOR MAKING PLASTIC ARTICLES; **3,248,757,** same, APPARATUS FOR MAKING PLASTIC ARTICLES, **filed** Dec. 8, 1970, D.C. Conn. (Bridgeport), Doc. B–226–C, *American Universal, Inc.* v. *Susemihl Magnesium Etching Co., Inc. and Swan Engineering Co., Inc.*

3,157,137, Clay and Letson, METHOD AND APPARATUS FOR DISPENSING FEED TO LIVESTOCK, **filed** Mar. 23, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c687, *Clay Equipment Corporation* v. *The De Laval Separator Company.* Consent judgment, case dismissed, Dec. 15, 1970.

3,161,908, P. Walach, HYDRAULIC DOOR CLOSER, **filed** Nov. 10, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c2804, *Monteray Manufacturing Co.* v. *Hartzell Manufacturing, Inc. et al.*

3,229,932. (See 3,096,048.)

3,248,757. (See 3,150,216.)

3,296,052, A. M. Bechtold, MEANS AND METHOD FOR POSTFORMING PLASTIC LAMINATED PRODUCTS, **filed** Dec. 16, 1970, D.C., M.D. Fla. (Tampa), Doc. 70–572–C, *Roberts Consolidated Industries Inc.* v. *Stewart Loehr, doing business as Stewart Loehr Laminate Tool Mfg.*

3,297,831. (See 3,146,319.)

3,325,018, L. A. Wright, ARTICULATING CRANE, **filed** Dec. 7, 1970, D.C., W.D. Wash. (Seattle), Doc. 9371, *Star Iron & Steel Co. and International Terminal* v. *Freuhauf Corporation.*

3,343,375, L. K. Quick, LATENT HEAT REFRIGERATION DEFROSTING SYSTEM, **filed** Oct. 28, 1970, D.C. Del. (Wilmington), Doc. 4002, *Hussman Refrigerator Co., and Pet Incorporated* v. *Hillman Coal & Coke Company, and Melchior, Armstrong, Dessau, Inc.*

3,359,116, L. L. Little, PROCESS OF MAKING SOUR CREAM TYPE PRODUCTS AND CREAM CHEESE; **3,378,375,** same, METHOD OF PREPARING ACIDIFIED DAIRY PRODUCTS, **filed** Dec. 3, 1970, D.C., S.D. Ohio (Cincinnati), Doc. 7771, *The Battelle Development Corp.* v. *Diamond-Shamrock Corp.*

3,378,375. (See 3,359,116.)

3,409,000, Brader and Tanasse, SYSTEM FOR HEATING LARGE VOLUMES OF AIR, **filed** Dec. 2, 1970, D.C., E.D. Wash. (Yakima), Doc. 2676–C, *Redi-Fire Heating, Inc.* v. *Orchard Rite, Inc.*

3,439,452, O. Kain, MIRRORED DOOR APPARATUS, **filed** Dec. 11, 1970, D.C., C.D. Calif. (Los Angeles), Doc. 70–2781–EC, *Oscar Kain* v. *Manufacturers Mirror Door Co., Inc.*

3,444,621, E. C. Pletcher, ORTHODONTIC APPLIANCE, **filed** May 15, 1970, D.C.N.J. (Newark), Doc. 616–70, *G.A.C. International, Inc.* v. *Unitek Corporation.* Consent judgment dismissing complaint, Dec. 10, 1970.

3,458,102, Zanger and Szasz, SEMICONDUCTOR WAFER PICKUP AND BONDING TOOL, **filed** Nov. 30, 1970, D.C., C.D. Calif. (Los Angeles), Doc. 70–2681–CC, *Kulicke & Soffa Industries, Inc.* v. *Gaiser Tool Company.*

3,491,446, Griffiths and Martin, EXTENSION DEVICE, **filed** May 13, 1970, D.C., N.D. Calif. (San Francisco), Doc. C70–1011–AJZ, *Keith K. Griffiths and James D. Martin* v. *Kalabar, Inc.* Consent judgment, plaintiff owner of patent and defendant has infringed, June 17, 1970.

3,494,253, Hood and Trultt, METALLIC STRIP MILLING MACHINE, **filed** Dec. 15, 1970, D.C., E.D.N.Y. (Brooklyn), Doc. 70–C–1517, *Metals Engineering Company* v. *North American Specialties Corporation.*

Patents Available for Licensing or Sale

D. 217,444. WHEELED CARRIER. Leo Stein, Box 1063, F.D.R. station, New York, N.Y., 10022.

3,191,513. FOLDING BELLOWS WITH INTERLOCKING CORNERS FOR PHOTOGRAPHIC DEVICES. Correspondence to: Central Trust Company Rochester N.Y., 44 Exchange St., Rochester, N.Y., 14614. Attn: William K. Sjea, Asst. Vice Pres.

3,225,761. FATIGUE SUPPORT. Robert Swensen, 120 Poincianna Drive, Martinez, Ga., 30907.

3,420,503. DEVICE FOR MAKING A CONTROLLED DESCENT. T/Sgt. Otto Stangl, Lot 23, Trailer Park, Langley A.F.B., Va., 23365.

3,535,667. ELECTRICAL SAFETY DEVICE. Henry C. Harnish, Jr., and Anthony J. Osello, Elcock Ave., Boonton, N.J., 07005.

3,559,328. LINE-CASTER ATTACHMENT FOR FISHING ROD. Royal B. Lesher, 3200 W. 29th Turnagain S., Anchorage, Alaska, 99503.

3,559,988. SPRING TYPE ARM EXERCISING DEVICE. Russell C. Greenlees, 316 E. Shadbolt St., Lake Orion, Mich., 48035.

3,568,355. SLIDING FISHING SINKER. Jack V. Hassell, 902 Del Paso Blvd., Space #3, Sacramento, Calif., 95815.

3,570,176. TOY MACHINE GUN. Henry J. Palmer, 699 N. Broad St., Philadelphia, Pa., 19123.

3,570,793. FISH POLE HOLDER FOR CASTING-SPINNING-DEEP SEA FISHING ROD. Joseph T. Shackel, 14636 Bringard, Detroit, Mich., 48205.

3,577,386. PROTECTIVE HEADGEAR. Norma E. Fisher, Rte. #1, Cedar, Minn., 55011.

The following 2 patents are offered by: Russell W. Weidenbacker, Box 153, Haverford, Pa., 19041.

3,558,149. ELASTOMERIC-BONDED ICE SKATE.

3,545,778. SAFETY AND DECORATIVE COVER FOR ICE SKATES.

The following 2 patents are offered by: Zed Cunningham, 4101 Green Court, Cleveland, Ohio, 44104.

3,038,528. TIRE MOUNTING APPARATUS.

3,347,998. TELEPHONE HANDSET HOLDER.

The following 3 patents are offered by: John W. Barnd, 32 Hollybrook Road, Paramus, N.J.

3,351,128. MULTI-ZONE TEMPERATURE CONTROL.

3,496,991. FLUID TEMPERATURE REGULATING METHOD AND APPARATUS.

3,515,345. MULTI-ZONE TEMPERATURE CONTROL.

General Electric Company is prepared to grant non-exclusive licenses under the following 19 patents upon reasonable terms to domestic manufacturers.

Applications for license under the following 2 patents may be addressed to: Patent Counsel, Mobile Radio Department, General Electric Co., Lynchburg, Va., 24502.

3,054,966. CRYSTAL CONTROLLED OSCILLATOR WITH TEMPERATURE COMPENSATING MEANS.

3,543,053. ELECTRONIC SINGLE-POLE, DOUBLE-THROW SWITCH.

Applications for license under the following 3 patents may be addressed to: Department Patent Counsel, Apollo & Ground Systems, General Electric Co., P.O. Box 2500, Daytona Beach, Fla., 32015.

3,550,114. PREWIRED ADDRESS SEQUENCER FOR SUCCESSIVE APPROXIMATION ANALOG TO DIGITAL CONVERTER.

3,555,298. ANALOG TO PULSE DURATION CONVERTER.

3,564,538. MULTIPLE SLOPE ANALOG TO DIGITAL CONVERTER.

Applications for license under the following 14 patents may be addressed to: Patent Counsel, Audio Electronics Business Department, Bldg. 1, Electronics Park, General Electric Company, Syracuse, N.Y., 13201.

3,561,766. SWITCH ACTUATING MECHANISM FOR RECORD PLAYER.

3,560,001. TURNTABLE AND TONE ARM MECHANISM FOR RECORD PLAYER.

3,492,004. GUIDING STRUCTURE FOR PHONOGRAPH TONE ARMS.

3,495,836. PORTABLE RECORDING APPARATUS.

3,495,839. TURNTABLE RECESS FOR RECORD REMOVAL.

3,501,214. LID LATCH FOR PHONOGRAPH.

3,500,219. AUDIO AMPLIFIER.

3,521,889. RECORDING APPARATUS.

3,527,530. SLIDE VIEWER.

3,531,130. PIVOTAL SUPPORT ASSEMBLY FOR PHONOGRAPH RECORD AND PLAYBACK ARMS.

3,417,322. SIMPLIFIED PIEZORESISTIVE FORCE SENSING DEVICE.

D. 218,911. PORTABLE PHONOGRAPH OR SIMILAR ARTICLE.

3,498,659. MULTISECTION CASING AND LATCH MECHANISM THEREFOR.

3,534,180. PHONOGRAPH PREAMPLIFIER WITH DIRECT DC BIAS COUPLING BETWEEN THE TRANSISTOR AND PIEZORESISTIVE PICKUP.

Registration to Practice

The following list contains the names of applicants for registration to practice before the United States Patent Office who attained passing grades in the examinations of March 31, and September 15, 1970, respectively. Information tending to affect the eligibility of any of said applicants on moral or ethical grounds should be furnished the Commissioner of Patents on or before June 14, 1971.

ROBERT GOTTSCHALK,
Apr. 22, 1971. *Chairman, Committee on Enrollment.*

LIST OF APPLICANTS

Baehr, Fred J., Jr., 212 Monticello Drive, Export, Pa. 15632
Blodgett, Gerry A., 39 Highland St., Worcester, Mass. 01608
Eipper, Eugene B., 233 Grandview Ave., Pitman, N.J. 08071
Fleming, Frederick A., 1860 Highland Parkway, St. Paul, Minn. 55116
Hagopian, Robert W., 109 Hemenway Ct., Boston, Mass. 02115
Kelleher, John J., 111 S. 4th St., Bethpage, N.Y. 11714
Krawitz, Willie, 3001 Chapel Hill Rd., Orange, Calif. 92667
Lloyd, Lewis L., 80 Main St., Landisville, Pa. 17538
O'Reilly, David, 327 Riley St., Falls Church, Va. 22046
Penland, Raphael B., 1305 Parkington Lane, Bowie, Md. 20715
Skinkiss, Ralph J., 1255 Flicker Drive, Florissant, Mo. 63031
Spicer, James M., 273 East Drive, Oak Ridge, Tenn. 37830
Stott, Ronald A., 206 Helen St., North Syracuse, N.Y. 13212
Thomas, Gilbert A., 14711 Mimosa Lane, Tustin, Calif. 92680
Walpert, Gary A., 1321 Worcester Road, Framingham, Mass. 01701
Wildensteiner, Otto, 2207 Seminary Road, Silver Spring, Md. 20910

Certificates of Correction for the Week of May 18, 1971

Re. 26,963	3,544,327	3,556,147	3,560,396
3,240,799	3,544,610	3,556,220	3,560,535
3,372,414	3,544,695	3,556,314	3,560,572
3,375,414	3,546,194	3,556,512	3,560,576
3,440,051	3,546,199	3,556,904	3,560,639
3,485,797	3,546,980	3,556,923	3,560,751
3,496,244	3,547,684	3,557,109	3,560,793
3,499,008	3,549,592	3,557,117	3,561,108
3,503,758	3,549,608	3,557,207	3,561,369
3,509,211	3,550,434	3,557,460	3,561,665
3,517,558	3,551,429	3,557,473	3,461,773
3,521,672	3,551,525	3,557,648	3,562,160
3,523,768	3,551,593	3,557,881	3,562,282
3,534,404	3,551,688	3,557,916	3,562,338
3,535,134	3,552,409	3,558,335	3,562,348
3,536,137	3,552,764	3,558,418	3,562,580
3,536,749	3,553,428	3,558,585	3,562,785
3,537,852	3,553,614	3,558,624	3,563,448
3,538,184	3,554,046	3,558,692	3,563,604
3,539,366	3,554,404	3,558,747	3,563,738
3,539,461	3,554,430	3,558,811	3,563,966
3,542,818	3,554,502	3,558,985	3,565,165
3,542,926	3,554,624	3,559,094	3,565,671
3,543,704	3,555,097	3,559,546	
3,543,735	3,556,081	3,560,177	

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MAY 4, 1971

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-02-70
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-02-69
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	2-10-70
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-03-70
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-17-69
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	8-17-70
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	12-11-69
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	3-13-70
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	3-03-70
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	1-21-70
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	6-03-70
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	3-09-70
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	1-02-70
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	2-02-70
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—C. F. GAREAU, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	6-08-70
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	1-06-70

Expiration of patents: The patents within the range of numbers indicated below expire during May 1971, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,677,129 to 2,679,644, inclusive
Plant Patents..... Numbers 1,274 to 1,281, inclusive

REISSUES

MAY 18, 1971

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

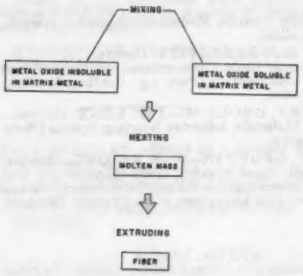
27,123
EXTRUDING FIBERS HAVING OXIDE SKINS

Norman E. Alber, Mentor, Ohio, and Walter E. Smith, Hingham, Mass., assignors to Clevite Corporation

Original No. 3,216,076, dated Nov. 9, 1965, Ser. No. 191,340, Apr. 30, 1962. Application for reissue May 26, 1969, Ser. No. 835,867

Int. Cl. B22d *11/00*

U.S. Cl. 164—86 **8 Claims**



Metallic fibers and filaments made by extrusion of certain molten alloys into air, said alloys containing a major portion of a metal the oxide of which is soluble in the melt and a minor portion of a metal the oxide of which is insoluble in the melt. The oxide skin formed by extrusion into air stabilizes the molten jet pending solidification.

27,124
WOOD DRYING METHOD

Robert W. Erickson, St. Paul, Minn., assignor to The Regents of the University of Minnesota, Minneapolis, Minn.

No Drawing. Original No. 3,309,778, dated Mar. 21, 1967, Ser. No. 523,869, Feb. 1, 1966. Application for reissue Dec. 29, 1969, Ser. No. 888,180

Int. Cl. F26b *5/06*

U.S. Cl. 34—5 **4 Claims**

A method of accelerating the drying rate of lumber, such as redwood, which is normally susceptible to damage if subjected to rapid drying at elevated temperatures. Such high moisture content lumber is subject to damage in the form of collapse and honeycombing and to shrinkage. It has been discovered that lumber may be upgraded and damage minimized when the lumber in green condition is pretreated by thorough freezing of its liquid fraction and then the pretreated lumber is dried rapidly by subjecting to conditions of low relative humidity and high temperature at least 30° F. above the critical temperature at which damage normally occurs, 110° to 120° F. in the case of redwood. Preferably at least a substantial portion of the pretreated lumber is permitted to thaw by returning to ambient temperature before rapid drying.

PATENTS

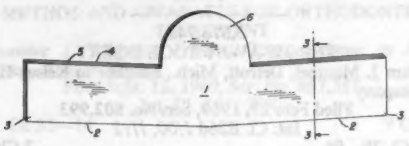
GRANTED MAY 18, 1971

GENERAL AND MECHANICAL

3,578,736
HAT AND SWEATBAND INSERT THERFOR

Norman L. Dootson, San Francisco, Calif., assignor to Winifred M. Colombo, Mill Valley, Calif., fractional part interest

Filed Oct. 20, 1969, Ser. No. 870,431
Int. Cl. A42b *1/02*
U.S. Cl. 2—181 5 Claims

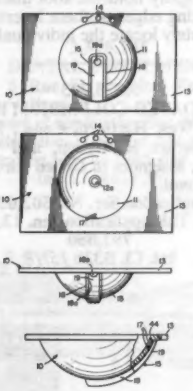


A hat having a sweatband and an elongated readily insertable and discardable insert. The insert includes a perspiration absorbent face portion and a moisture impervious back portion with an upstanding central member. The central member extends above a sweatband to expose the absorbent portion to facilitate perspiration evaporation therefrom and to provide a grasping portion whereby the insert can be readily inserted or removed.

3,578,737
MONOLITHIC SINK AND VANITY TOP COMBINATION

Kay L. Ruggles; Dale B. Gunnerson, and Howard S. Clark, Salt Lake City, Utah, assignors to American Standard Inc., New York, N.Y. Division of Ser. No. 635,477, May 2, 1967, Pat. No. 3,496,612.

Filed July 15, 1969, Ser. No. 870,995
Int. Cl. A47k *1/04*
U.S. Cl. 4—166 2 Claims



An integral sink and vanity top combination of a thermosetting synthetic plastic composition, preferably of a polyester resin type, wherein the bowl area is integrally formed with the vanity top area. The bowl area is provided with an overflow passageway that extends along the sidewall of the bowl. An improved combination having one or more sink bowls is disclosed and which is manufactured by a method which includes the steps of applying appropriate coating to the mold and thereafter applying an initial pour of the polyester resin into the mold, mounting an overflow tube in proximity to the bowl mold area, then applying a bonnet over the overflow tube and bowl area after the first pour has become tacky, and then making a second pour of the same material into the interior of the bonnet area over the first pour to form the bowl area to shape in integral assembly with the vanity top area. A mineral filler may be added to the resin for the initial pour to produce different desired finishes on the sink and vanity top combination. As the material is permitted to gel the mold is vibrated to permit entrapped gasses to escape to insure a product essentially free of pockets of entrapped air.

3,578,738
FLOOR MAT

Martin Robert Hughes, Grand Rapids, Mich., assignor to Bissell Inc., Grand Rapids, Mich.

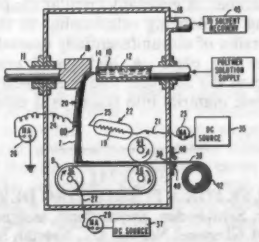
Filed Feb. 25, 1969, Ser. No. 802,147
Int. Cl. A47l *23/22*; A47g *27/02*
U.S. Cl. 15—215 6 Claims

A floor mat having a thin perforate water-absorbent top layer for wiping the feet on. An intermediate spongy layer receives water, but no appreciable dirt, from the top layer and also reinforces the top layer against side loads. An imperforate tray supports both layers and serves as a water receptacle. Ribs on the tray assist in preventing sliding of the intermediate layer thereon. The tray is snap fit onto a clamping frame which also holds the edge portions of both layers in place.

3,578,739
APPARATUS FOR APPLYING ELECTROSTATIC CHARGE TO FIBROUS STRUCTURE

Henry H. George, Berkeley Heights, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

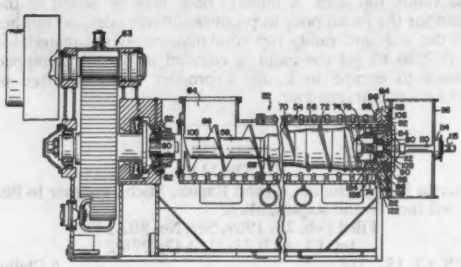
Filed May 13, 1969, Ser. No. 824,183
Int. Cl. D01d *9/00*
U.S. Cl. 18—8 8 Claims



An apparatus for electrostatically charging fibrous material being forwarded in a linear path that includes an ion gun and an opposed grounded target electrode positioned on opposite sides of the path. The electrode has a surface facing the ion gun that is covered by a dielectric material having a re-

sistance measured at about 65° C. of between about 1×10^{6} and 10^{10} ohms. Covering materials with resistances in this range minimize the disruptive effect on continuity of operation of polymer buildup on the target electrode.

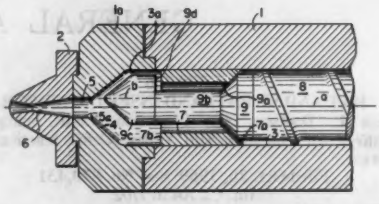
3,578,740
DEWATERING PELLETIZER APPARATUS
Billy J. Redding; John T. Steadman, and Lorel J. Bragg, St. Albans, W. Va., assignors to Goodrich Gulf Chemicals, Inc.
Filed Oct. 8, 1968, Ser. No. 765,758
Int. Cl. B29f *3/00*
U.S. Cl. 18—12 **10 Claims**



Disclosed is a dewatering pelletizer apparatus and method for dewatering and reducing the size of wet polymeric material.

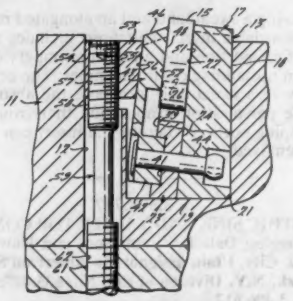
The apparatus is comprised of an elongated barrel housing having an input end and an output end. Escape passages are provided in the barrel wall to permit the escape of liquid from the interior of the housing. A rotatable shaft having screw flights therein is disposed axially within the housing with one end of the shaft disposed within the output end of the housing. A bearing boss is supported within the housing and provides a bearing support for the shaft end. A generally annular screw flight section is secured to the shaft end and is defined by external and internal screw flights. The annular space between the external screw flight and the internal wall of the housing defines a discharge passage for polymeric material. The internal screw flight of the annular screw flight section is disposed closely adjacent the bearing boss thereby preventing polymeric material from entering the bearing chamber. An oil seal is provided adjacent the bearing and extends from the bearing boss into contact with the shaft. A secondary internal screw flight member is secured to the shaft closely adjacent an annular sealing wall extending from the bearing boss. The secondary internal screw flight member and the internal screw flight of the annular screw flight section cooperate to prevent polymeric material from entering the bearing chamber. A generally circular die plate is secured to said housing in blocking relationship to the output end thereof. A plurality of circumferentially spaced apertures are defined in the die plate. A high-speed cutting blade is disposed adjacent the die plate and is adapted to cut the extruded polymeric material into flakes as it emerges from the die plate.

3,578,741
VALVE FOR A PLASTIFYING DEVICE
Armin Blumer, Schwanden, Switzerland, assignor to Maschinenfabrik und Giesserel Netstal AG, Netstal, Switzerland
Filed May 27, 1969, Ser. No. 828,117
Claims priority, application Switzerland, May 31, 1968, G8198/68
Int. Cl. B29f *1/00*
U.S. Cl. 18—30 **11 Claims**



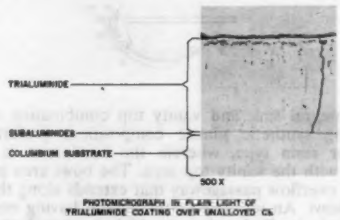
In a plastifying device, a valve member is provided on the leading end of a worm for regulating flow to an injection head. The valve is displaceable in the axial direction of the worm and it has a head portion on its leading end, the axis of which is offset from the axis of the worm so that, as the worm rotates, the head continuously affords a partial closure for the end of the bore containing the worm and effects a mixing action as the material is fed to the injection head.

3,578,742
THROW-AWAY TOOL INSERT
William J. Manthei, Detroit, Mich., assignor to Kelsey-Hayes Company
Filed Feb. 27, 1969, Ser. No. 802,993
Int. Cl. B26d *1/00, 1/12*
U.S. Cl. 29—96 **2 Claims**



A machining tool for forming a surface and including a plurality of removable tool holders each of which holds one or more throwaway tool inserts. The tool holders are constructed so as to rigidly hold the tool inserts for precluding damage to the cutting edges of these inserts. In addition, the tool holders accurately locate the individual tool inserts.

3,578,743
ALUMINUM COATED COLUMBIUM BASE ALLOYS
Elihu F. Bradley, West Hartford, Conn.; Edwin S. Bartlett, Worthington; Horace R. Ogden, and Robert I. Jaffee, Columbus, Ohio, assignors to United Aircraft Corporation, East Hartford, Conn.
Continuation of application Ser. No. 502,650, Oct. 22, 1965, now abandoned. This application Jan. 13, 1969, Ser. No. 791,880
Int. Cl. B32b *15/18*
U.S. Cl. 29—194 **20 Claims**



PHOTOMICROGRAPH IN PLAIN LIGHT OF TRIALUMINIDE COATING OVER UNALLOYED Cb

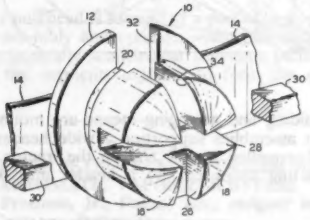
This invention provides protective coatings for columbium alloys. The coatings comprise columbium aluminide modified

by titanium and one or more of the following comodifiers Cr–, V–, Mo–, and Mo–Ta. The coatings can be provided by coating with aluminum a substrate consisting of columbium alloyed with these modifiers. The modified columbium aluminide coatings may remain on the substrate on which they are produced, or they can be removed from the original substrate and applied to other Cb-alloy substrates. Exemplary of the protective coatings of this invention are (*a*) a coating consisting essentially of columbium aluminide modified by 7 percent of Ti and 9 percent Mo, (*b*) a coating consisting essentially of columbium aluminide modified by 7 percent of Ti and 4 percent of V, (*c*) a coating consisting essentially of columbium aluminide modified by 8 percent of Ti and 4 percent of Cr, and (*d*) a coating consisting essentially of columbium aluminide modified by 8 percent of Ti, 11 percent of Ta, and 11 percent of Mo.

3,578,744
METHOD AND APPARATUS FOR ORTHODONTIC TREATMENT

Alexander J. Wildman, Eugene, Oreg., assignor to Alexo, Corp., Eugene, Oreg.

Filed Sept. 12, 1969, Ser. No. 857,351
Int. Cl. A61c *7/00*
U.S. Cl. 32—14 **9 Claims**

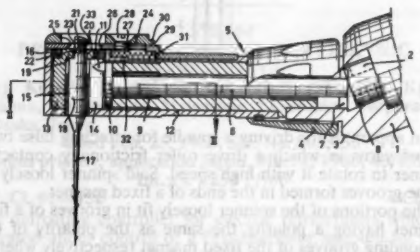


After securement of brackets of novel design to teeth of a patient to be treated, impression is taken of the mouth. The impression is removed, replicas of brackets are inserted in impression and casting made of teeth which are then separated and positioned in ideal location in a model. Arch wires are then preformed to fit brackets on ideal model and after preforming, arch wire transferred to mouth of patient. Brackets have groove to receive arch wire which is locked in place by follower and snap ring.

3,578,745
DENTAL INSTRUMENT

Marcel Garnier, 6 Rue St. Antoine, Besancon, and Roger Blanc, Chambery, France

Continuation-in-part of application Ser. No. 438,364, Mar. 3, 1965, and a continuation-in-part of 494,629, Oct. 11, 1965. This application May 6, 1968, Ser. No. 726,777
Int. Cl. A61c *5/02*
U.S. Cl. 32—57 **5 Claims**

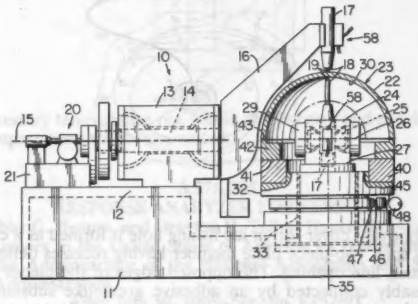


In a dental instrument for the treatment of dental roots by dental instruments such as broaches or reamers, means are provided for causing the instrument to alternately rotate in one direction and in the opposite direction, the means causing an angle of rotation of the instrument which is at the most equal to the angle which corresponds to its yield strength, or elastic limit.

3,578,746
GAGING APPARATUS AND METHOD

John H. Walker, Dayton, Ohio, assignor to The Bendix Corporation

Filed Feb. 13, 1969, Ser. No. 799,047
Int. Cl. G01b *13/02*
U.S. Cl. 33—174 **23 Claims**

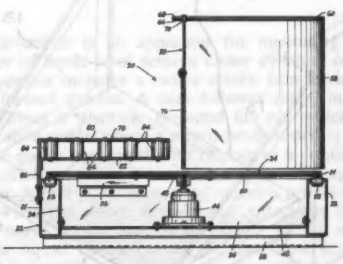


An apparatus for and method of controlling the force exerted by a gaging probe against a workpiece wherein gaging movement of such probe is provided along a rectilinear path coinciding with a longitudinal axis of the probe and the force exerted by the probe is kept substantially constant at all angles of inclination of the longitudinal axis of the probe relative to a reference plane.

3,578,747
SHRINK TUNNEL WITH TURNTABLE

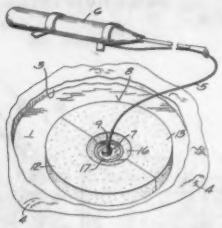
Richard F. Schramm, St. Louis, Mo., assignor to Speed Equipment Incorporated, St. Louis, Mo.

Filed Jan. 3, 1968, Ser. No. 695,408
Int. Cl. F26b *11/00*
U.S. Cl. 34—184 **6 Claims**



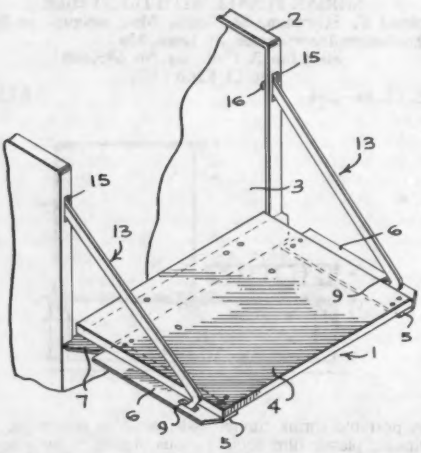
A portable shrink tunnel with turntable means for heat shrinking plastic film about various objects to be wrapped. The shrink tunnel is provided with a turntable disc having a loading station in which the objects are wrapped and placed on the turntable, a heat-shrinking station within an overlying shrink tunnel that may be expandable to cover one-quarter to one-half of the turntable, and a discharge station on the turntable which is adjacent the receiving station. The turntable is constantly rotated and carries the objects to be wrapped 360° from the receiving station, through the shrink tunnel, and the discharge station. The shrink tunnel is composed of two arcuate housing sections telescopically adjustable to vary the tunnel length, and provide a means for controlling the tunnel heat supplied in the tunnel and also to vary the area of the loading or receiving station. A heating element may be positioned underneath the turntable disc at the receiving station to heat the disc which aids in maintaining the wrapping film about the article to be wrapped before it is charged to the heat shrink tunnel.

3,578,748
ICE FISHING HOLE COVER
Raymond M. Hurd, 2548 S. 78th St., Milwaukee, Wis.
Filed Feb. 11, 1969, Ser. No. 798,396
Int. Cl. A01k *93/00, 97/12*
U.S. Cl. 43—44.9 7 Claims



A buoyant cover for an ice fishing hole is formed as a centrally split, two-piece plate member having recesses defining a fishing line opening. The opposed edges of the pieces are releasably connected by an adhesive greaselike substance. The plate member is covered with a water-repellent material and has a black coating on its top surface to absorb heat.

3,578,749
SELF-LOCKING DROP-DOOR
Homer G. Woten, 912 Perrin Ave. N. W., Winter Haven, Fla.
Filed May 5, 1969, Ser. No. 821,714
Int. Cl. E05f *1/00*
U.S. Cl. 49—387 4 Claims

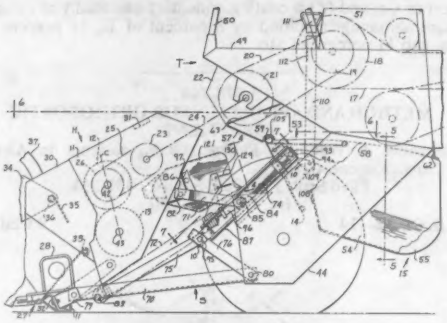


A drop-door hinged at the bottom to an enclosure, and having support bars pivotally connected to the door and slidable through slots in the enclosure adjacent the opening closed by the door. The support bars are angular, with short arms adjacent the door to move into the slots in the enclosures, and counterweight arms to move about the bottoms of the slots in the enclosures as fulcrums to assume downwardly depending self-locking positions.

ERRATUM

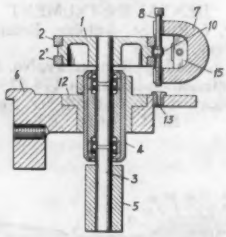
For Class 52—156 see:
Patent No. 3,578,156

3,578,750
CROP GUIDING AND ARRANGING MEANS FOR A SELF-PROPELLED HARVESTING MACHINE
Lawrence M. Halls, New Holland; Henry N. Lausch, Leacock, and Bruce D. Schwalm, Leola, Pa., assignors to Sperry Rand Corporation, New Holland, Pa.
Filed Apr. 3, 1969, Ser. No. 813,219
Int. Cl. A01d *43/00*
U.S. Cl. 56—23 11 Claims



Crop guiding and arranging means are mounted on two suspension assemblies supporting a wide header on a narrower self-propelled tractor and on the tractor for guiding and deflecting crops cut by a header into windrows or swaths.

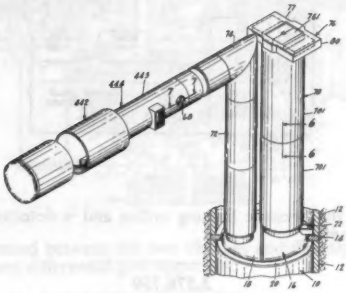
3,578,751
APPARATUS FOR DRIVING SPINDLE FOR EFFECTING FALSE TWISTING OF YARNS
Nobuhisa Kodaira, 7-10, Kami-Renjyaku 2-chome, Mitaka, and Norio Motegi, 2-8, Sakura 1-chome, Noriо, Tokyo, Japan
Filed July 14, 1969, Ser. No. 841,438
Claims priority, application Japan, Aug. 21, 1968, 43/59192
Int. Cl. D01h *7/92*
U.S. Cl. 57—77.45 5 Claims



An apparatus for driving a spindle for effecting false twisting of yarns in which a drive roller frictionally contacts a spinner to rotate it with high speed. Said spinner loosely fits in the grooves formed in the ends of a fixed magnet.

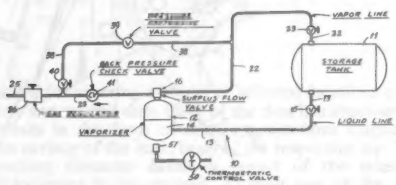
The portions of the spinner loosely fit in grooves of a fixed magnet having a polarity the same as the polarity of corresponding grooves of the fixed magnet respectively whereby due to repulsion produced between the polarities, said spinner is urged to abut said drive roller and also its rocking motion is avoided. In front of respective poles of said fixed magnet, a metal plate of high permeability is provided with an airgap therebetween to increase magnetic flux density of said polarity portions.

3,578,752
SEGMENTED BULKHEAD FOR TUNNELS AND THE LIKE
Richard W. Stevens, Oconomowoc, Wis., assignor to Milwaukee Boiler Manufacturing Company, Milwaukee, Wis.
Filed Sept. 23, 1968, Ser. No. 761,770
Int. Cl. E02d *23/00*
U.S. Cl. 61—83 4 Claims



A circular bulkhead is formed of a pair of segments and is capable of assembly and erection within the confines of a tunnel. The generally semicircular segments include means for joining the segments together to form the completed bulkhead.

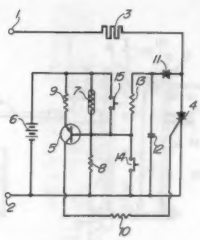
3,578,753
LIQUEFIED PETROLEUM VAPORIZER WITH AUTOMATIC VAPORIZER BYPASS
William P. Freeman, Jr., Dallas, Tex., assignor to John E. Mitchell Company, Dallas, Tex.
Filed Feb. 28, 1969, Ser. No. 803,185
Int. Cl. F17c *9/02*
U.S. Cl. 62—51 6 Claims



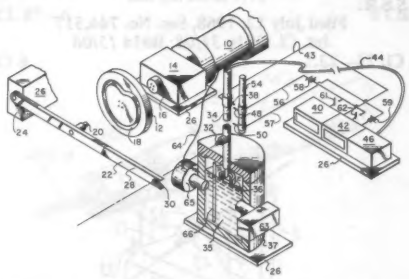
A liquid petroleum vaporizer with means to supply vapor from a storage tank under conditions of demand in excess of the capacity of the vaporizer and with an automatically operable valve-controlled line bypassing the vaporizer when the vapor in the storage tank is adequate to supply the demand.

3,578,754
DEFORSTING CONTROLLER FOR ELECTRIC REFRIGERATOR
Zenji Kusuda, Ibaragi-shi, and Takeji Kobayashi, Kyoto, Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan
Filed Feb. 25, 1969, Ser. No. 802,035
Claims priority, application Japan, Mar. 1, 1968, 43/13925
Int. Cl. F25d *21/06*
U.S. Cl. 62—156 4 Claims

A defrosting controller for electric refrigerators which is operated under control of a first transistor adapted for triggering a silicon-controlled rectifier depending upon the result detected by a temperature detector in the freezer of the refrigerator and under control of a second transistor for keeping the first transistor in one state during the defrosting operation so that the defrosting operation is automatically stopped as soon as the temperature within the freezer reaches a predetermined temperature after starting the defrosting operation. Thus, frost accumulated within the freezing compartment can completely be removed and an unnecessary temperature rise within the freezing and provisions compartments can be prevented.



3,578,755
RESPONSE ANALYZER FOR SENSORS
Bobby G. Bynum, and Drayton H. Talley, Huntsville, Ala., assignors to the United States of America, as represented by the Administrator of the National Aeronautics and Space Administration
Filed July 30, 1969, Ser. No. 845,991
Int. Cl. G01f *25/00*
U.S. Cl. 73—1R 7 Claims

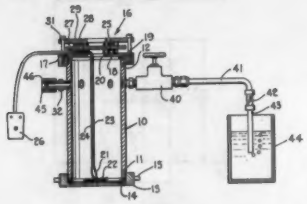


The invention is an apparatus for measuring the performance of liquid level sensors under dynamic conditions. The apparatus includes a motor driven cam having a cam groove formed therein. A cam follower riding in the cam groove drives a pivotally mounted lift rod which in turn drives a slide rod to which a sensor being tested is attached. The slide rod is positioned with respect to a container such that the attached sensor is moved in and out of a liquid in the container. A first signal generating means is provided that indicates when the sensor actually first enters the liquid and another signal is generated by the sensor when it senses entering the liquid. By monitoring the time lapse between the signals it is possible to determine the response characteristics of the sensor upon entry into a liquid. A camera and light source are utilized to photograph conditions within the container during test of a sensor.

3,578,756
AUTOIGNITION TEST CELL
Fred D. Evans, Oviedo; Carlos L. Springfield, Titusville, and Coleman J. Bryan, Merritt Island, Fla., assignors to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Filed July 30, 1969, Ser. No. 845,971
Int. Cl. G01n *25/00*
U.S. Cl. 73—15 1 Claim

A chamber for analyzing test samples of materials, such as used in spacecrafts, under certain predetermined environmental conditions in order to determine autoignition temperatures and degree of decomposition is controlled atmospheres. The apparatus includes an elongated hermetically sealed cylindrical chamber which has a plurality of couplings

carried thereon. A vacuum pump, a source of gas, a bubbler system which bubbles through a mercury bath, a valve and other various items may be coupled to the couplings in order

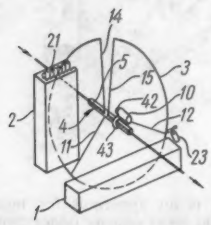


to produce predetermined environmental conditions within the chamber. The chamber is also provided with a viewing port and a thermocoupled probe for measuring the temperature of the test sample.

3,578,757
CHROMATOGRAPH FOR DETERMINATION OF ADMIXTURES IN GASES

Viktor Ivanovich Samuilov, oblast, Leninsky Raion doma Uniigaz, 4A, Kv.59, Moskovskaya Obisst; Jury Markovich Genkin, ulitsa Usacheva, 62, Kv.254, and Maria Dmitrievna Suvorova, Simonovsky val., 12, Kv. 171, Moscow, U.S.S.R.

Filed July 12, 1968, Ser. No. 744,517
Int. Cl. G01n *31/08;* B01d *15/08*
U.S. Cl. 73—23.1 **6 Claims**



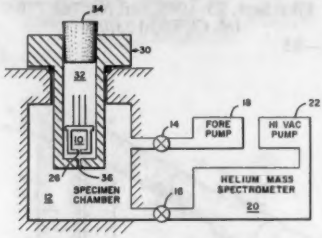
A chromatograph for the determination of admixtures in gases, comprises a chromatographic column bent in the form of at least a single helix coil or an arc of circle and which is rigidly secured on the shaft of a drive device in a plane perpendicular to the axis of the shaft. The shaft is mounted in stationary supports so that at the same time one portion of the chromatographic column is immersed in a refrigerant bath and the other portion of the column is in a heater, and during the rotation of the shaft said portions of the column subsequently pass through the cooling and heating zones.

3,578,758
ORIFICE GROSS LEAK TESTER

Thomas L. Altshuler, West Concord, Mass. assignor to the United States of America as represented by the Administration of the National Aeronautics and Space Administration.

Filed May 7, 1969, Ser. No. 822,519
Int. Cl. G01m *3/16*
U.S. Cl. 73—40.7 **3 Claims**

An orifice leak tester for use with a helium mass spectrometer is disclosed. The leak tester comprises a sample chamber, wherein an article to be tested is supported on a wire screen; an orifice formed in a wall common to the sample chamber and mass spectrometer specimen chamber; and means for directing a purging gas over the orifice and through the sample chamber. A specimen pressurized with helium gas is introduced into the previously purged sample chamber. Helium gas effusing from a leaking specimen flows

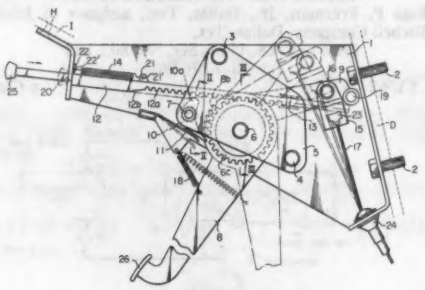


through the pressure limiting orifice and is detected by the spectrometer.

3,578,759
FOOT-OPERATED HAND-RELEASED BRAKE OF THE VEHICLE

Takeo Yamazaki, Anjo-shi, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed July 28, 1969, Ser. No. 845,436
Claims priority, application Japan, Aug. 3, 1968, 43/55048
Int. Cl. G05g *1/14*
U.S. Cl. 74—540 **5 Claims**



A foot-operated and hand-released brake of the vehicle in which a pedal is oscillatably pivoted by a shaft rotatably mounted on a bracket and an internal gear is carried on the shaft rotatably and eccentrically to the shaft. The rotation of the shaft swings the internal gear in mesh with an external gear provided on the pedal concentrically to the shaft, and rotating the internal gear with a speed largely reduced due to the slight difference in the number of teeth in the gears. An arm fixed to the internal gear releases the brake cable depending on the amount of the rotation of the shaft.

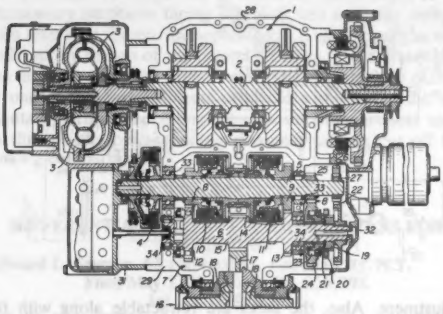
3,578,760
POWER TRANSMISSION APPARATUS

Kimino Shinmura, Tokyo, Japan, assignor to Kabushiki Kaisha Honda Gijutsu Kenkyusho, Saitama-ken, Japan

Filed Dec. 27, 1968, Ser. No. 787,404
Claims priority, application Japan, Jan. 17, 1968, 43/2147
Int. Cl. F16h *37/00;* B60k *17/06*
U.S. Cl. 74—701 **4 Claims**

A power transmission apparatus in which an input shaft driven by a prime mover is provided with respective driving gears for low-speed and high-speed operation and with spaced, respective hydraulic-operated frictional clutches for selectively connecting the gears to the shaft, there being an output shaft extending parallel to the input shaft and pro-

vided with spaced driven gears in mesh with respective driving gears and with an output gear partly projecting into the



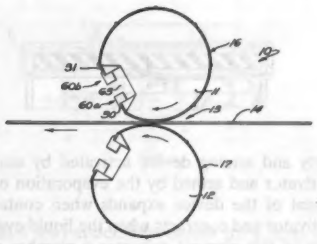
space formed between the two clutches and directly driving an adjacent differential gear apparatus.

3,578,761

SEVERING APPARATUS

Albert J. Sarka, Fairview Park, Ohio, assignor to Harris-Intertype Corporation, Cleveland, Ohio

Filed Sept. 12, 1968, Ser. No. 759,275
Int. Cl. B23d *25/12;* **B26d** *1/56*
U.S. Cl. 83—343 **13 Claims**



Apparatus for severing material at selected locations comprises first and second dies. Each of the dies has sheet-severing elements in the form of narrow projections extending above the surface of the main body of the respective die. The sheet-severing elements define a layout of the selected material locations to be severed. At least one of the dies comprises a plurality of separate discrete die sections. An additional die section is provided as a replacement for each die section in the event of damage thereto.

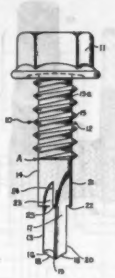
3,578,762

SELF-DRILLING, REAMING AND TAPPING SCREW

George Siebol, Orange, and Robert F. Kolec, Whittier, Calif., assignors to Armco Steel Corporation, Middletown, Ohio

Filed Apr. 14, 1969, Ser. No. 815,825
Int. Cl. F16b *25/00*
U.S. Cl. 85—41 **2 Claims**

A fastener comprising a screw having a head adapted to be engaged by means whereby it may be rotated so as to force it into a workpiece or the like at one end and a workpiece-engaging point at the other end. This fastener is designed to have the maximum tensile strength in the total fastener. To this end the shank of the screw, between the point and head, is formed into three sections. The first section, moving from the point towards the head, is of relatively small diameter and is provided with a pair of cutting edges having flutes extending therefrom whereby this section functions as a pilot drill, The next or intermediate section is of larger diameter. The aforementioned grooves or flutes extend into this section and define a second pair of cutting edges. Additionally, however, this intermediate section is provided with other cutting edges and flutes whereby this intermediate section constitutes a reaming section having multiple cutting edges with flutes extending therefrom These drilling and reaming sections are designed to give a positive round hole of the proper diameter so that the threaded section can engage the sides of the hole and distort the sheet metal enough so that a firm



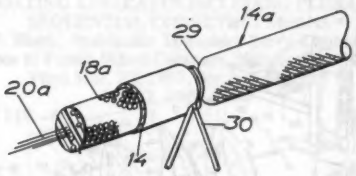
fastening is accomplished. The third section, therefore, that immediately adjacent the head, is provided with self-tapping screw threads of substantially constant diameter and uninterrupted by any grooves, flutes or the like.

3,578,763

FLOATABLE CORDS

Jan Hendrik Platou, Birkelundsbk 76, Paradis, near Bergen, Norway

Filed Mar. 12, 1968, Ser. No. 712,445
Int. Cl. D04c *1/12*
U.S. Cl. 87—6 **6 Claims**



A flexible floatable cord for use in fishing nets, trawls, water skiing and the like, which comprises a braided sleeve, a core of continuous filament threads incorporated therein and particles of an expanded plastic material disposed between said sleeve and said core, said particles being only attached to one another and to the sleeve and the core and forming a continuous cord in which the core is embedded. Further a process and an apparatus for producing said flexible floatable cord.

3,578,764

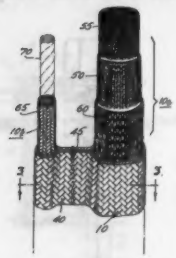
OVEN DOOR SEAL AND METHOD OF MAKING SAME

Robert L. Nunnally, Valley Forge, and Thomas L. Weil, Paoli, Pa., assignors to Bentley-Harris Manufacturing Company, Conshohocken, Pa.

Filed July 23, 1969, Ser. No. 844,083
Int. Cl. D04c *1/06*
U.S. Cl. 87—6 **9 Claims**

A heat-resistant gasket is provided for sealing a space between a door and a jamb around an access opening in an oven of the self-cleaning type. The gasket has a braided fiberglass jacket which has a line of juncture extending longitudinally to dispose a resilient metal mesh tubular sealing element and a tubular mounting element in spaced parallel relation therein, the mounting element being engaged by clamping means on the door which secures it thereto to dispose the sealing element in the space to be sealed. In addition, there is disclosed a method for fabricating the gasket which includes the steps of braiding the fiberglass jacket around both a knitted wire mesh core in the tubular sealing element and a paper core in the tubular mounting element as the elements advance in spaced parallel relation and joining

the braided jacket longitudinally between the elements by stitching, then shaping the sealing element, and heating the



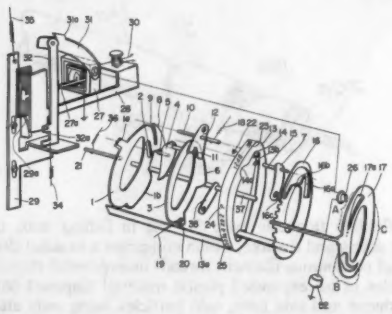
gasket assembly to an elevated temperature to disintegrate the paper core and to set its shape.

3,578,765

ELECTRIC EYE CAMERA

Tatsuo Kobayashi, Kaizuka, and Kayoshi Tsujimoto, Higashi, Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 10, 1968, Ser. No. 720,091
Claims priority, application Japan, Apr. 12, 1967, Apr. 13, 1967, Apr. 28, 1967, 42/23064;42/30516;42/27300
Int. Cl. G03b *7/12, 9/00*
U.S. Cl. 95—10 **13 Claims**



An electric eye camera to be operated either in a programmed exposure control mode or in an automatic exposure control with priority on shutter speed mode. The camera has a changeover ring to facilitate selection of the mode by simple operation. A lens aperture control ring is used to inhibit the mode of operation with priority on shutter speed as long as the lens aperture control ring is away from its initial position.

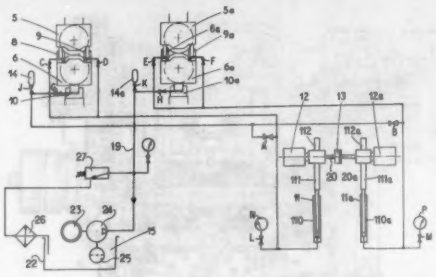
3,578,766

VARIABLE PRESSURE EMBOSSING MACHINE

Lucien Diolot, Neuilly Sur Seine, France, assignor to Societe Nouvelle Spidem, Paris, France

Filed Apr. 4, 1967, Ser. No. 628,325
Claims priority, application France, Apr. 4, 1966, 56353
Int. Cl. B44b *5/00;* **B30b** *3/04*
U.S. Cl. 101—23 **8 Claims**

An embossing machine having means to vary the pressure of the cooperating embossing rolls employing hydraulic power cylinders to provide the substantially constant main force pressing the embossing cylinders together. Control hydraulic jacks are placed operatively between the cylinders to press them apart with a predetermined selected pressure to thereby selectively vary the resultant engaging pressure of the cylinders. Preferably, the jacks and power cylinders receive their hydraulic fluid from the same supply and the jacks are provided with motor reducer control units that may be coupled together for simultaneous adjustment of the jacks on each axial end of the cylinders or uncoupled for separate



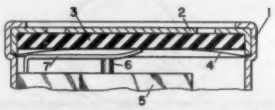
adjustment. Also, the jacks are retractable along with the upper cylinder supporting structure so that the cylinders may be easily removed and replaced.

3,578,767

SAFETY AND ARMING DEVICE

John T. M. Lee, Tamaqua, Pa., assignor to Atlas Chemical Industries, Inc., Wilmington, Del.

Filed Dec. 11, 1968, Ser. No. 782,886
Int. Cl. F42c *15/32*
U.S. Cl. 102—70.2 **4 Claims**



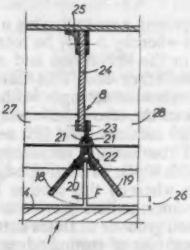
A safety and arming device activated by contact with a liquid activator and armed by the evaporation of the liquid. An element of the device expands when contacted by the liquid activator and contracts when the liquid evaporates; the expansion of this element collapses a member and the element's subsequent contraction activates a switch which arms the device.

3,578,768

PARTITIONING SYSTEM FOR FLUID CUSHIONS IN GROUND EFFECT MACHINES

Francois L. Giraud, Plaisir, France, assignor to Societe De L'Aerotrain, Paris, France

Filed June 27, 1968, Ser. No. 740,498
Claims priority, application France, Oct. 4, 1967, June 19, 1968, 123,278;155,691
Int. Cl. B61b *13/08*
U.S. Cl. 104—23 **15 Claims**



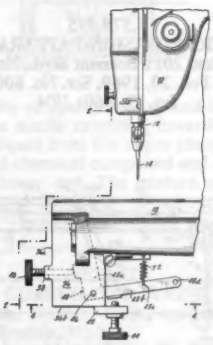
An arrangement for partitioning the compressed fluid cushion of ground effect vehicles and the like machines, said

arrangement including dihedral-shaped partitions extending across the cushions and facing one of the walls along which the machine is guided and sustained, said dihedral defining a compartment on either side of same; the outer edges of the elementary partitions facing said wall and normally oblique with reference thereto are separated by a clearance from said wall and by reason of the pivotal securing of the dihedral to the machine along the ridge of said dihedral, any leak of fluid in one of the compartments produces a shifting of the elementary partition bounding the opposite compartment so as to throttle the corresponding clearance and to cut off the leaking compartment.

3,578,769
DIFFERENTIAL FEED ATTACHMENT MEANS FOR SHIRRING

Edward L. Seaman, 65 Harvard St., Garden City, N.Y.

Filed May 1, 1969, Ser. No. 820,995
Int. Cl. D05b *27/08*
U.S. Cl. 112—208 **4 Claims**



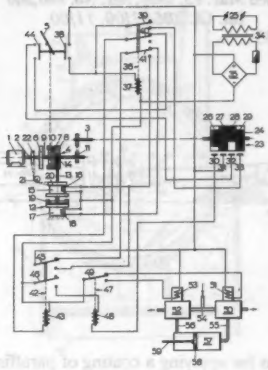
A differential feed attachment means for a drop feed sewing machine, said attachment being intended to replace the conventional feed dogs and consisting of two feed dogs arranged in tandem with the front feed dog being adjustable through a lever system relatively to the rear feed dog so that the amount of travel of the front feed dog can be in unison with the rear feed dog and may be quickly and easily varied by the operator while the machine is in motion to continuously or intermittently gather or shirr material being operated upon.

3,578,770
SEWING MACHINE

Johannes Franciscus Van Hazendonk, Zwanenburg, Netherlands, assignor to "De Jong & De Vlieger Machinehandel N.V.", Zwanenburg/Halfweg, Netherlands

Filed Dec. 18, 1968, Ser. No. 784,770
Claims priority, application Netherlands, Dec. 29, 1967, 6717780
Int. Cl. D05b *69/26, 65/02*
U.S. Cl. 112—219 **5 Claims**

A sewing machine is disclosed having a treadle-operated main clutch, an electromagnetic clutch and brake unit, a thread cutoff and an electric control circuit comprising a rotating needle positioning device. On pressing the treadle forwardly the main clutch is actuated whereby the driving motor of the machine drives the latter at the full operating speed and on subsequent disengagement of the treadle the electromagnetic clutch is actuated whereby the drive motor drives the machine through a reduction gear at a reduced needle positioning speed until the needle has reached its lowest position and is stopped by the actuation of the electromagnetic brake. When the treadle is moved from its forward position through its rest position to a rear position, the electromagnetic clutch remains energized until the machine has moved the needle to its highest position and is then

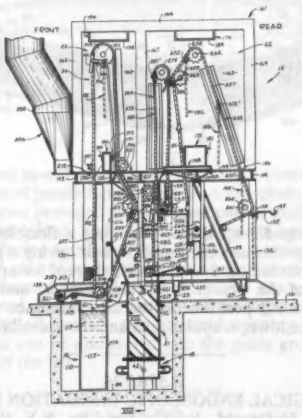


stopped. The thread cutoff is electrically actuated during the movement of the needle from its lowest to its highest position.

3,578,771
COATING APPARATUS INCLUDING PLURAL, SEQUENTIAL CONVEYING MEANS

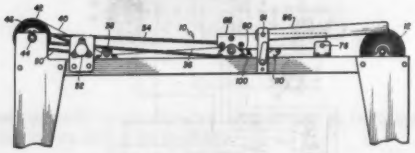
John W. Black, Prairieville Township, Barry County, Mich., assignor to Pemco Wheel Company, Kalamazoo, Mich.

Filed Mar. 22, 1967, Ser. No. 625,123
Int. Cl. B05c *11/00*
U.S. Cl. 118—6 **13 Claims**



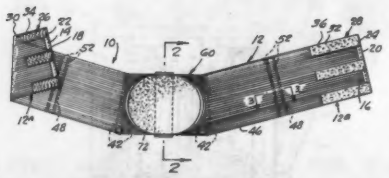
Plural treating stations comprise two downwardly opening ovens facing respectively an upwardly opening fluidized bed coating tank and a quench tank. An endless conveyor means conveys the article to be treated into and out of the first oven and delivers same to a second endless conveyor means which conveys the article into and out of the fluidized coating tank. Third endless conveyor means transfers the article from said second to a fourth endless conveyor means which conveys same into and out of the second oven and the quench tank.

3,578,772
APPARATUS FOR APPLYING A COATING TO SHEET MATERIAL
Robert B. Taylor, and Robert G. Walker, Fort Wayne, Ind., said Walker assignor to Allan W. Pedden, Fort Wayne, Ind.
Division of Ser. No. 462,506 June 9, 1965, Pat. No. 3,436,232. Filed Mar. 13, 1969, Ser. No. 840,860
Int. Cl. B05c *1/00, 11/00*
U.S. Cl. 118—33 **1 Claim**



An apparatus for applying a coating of paraffin to one side of a sheeting material having an applicator roll which is rotatable mounted in a container of liquid paraffin so that a lamination of paraffin is transferred to the face of the sheeting material and an adjustable brake having a pivotable crossbar provided with a friction pad for engagement with the supply roll for controlling the tension of the sheet material as it is drawn through the apparatus.

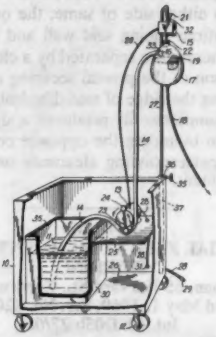
3,578,773
SUPPORTIVE ORTHOPEDIC DEVICE
August L. Schultz, 214 N. Harmon Drive, Mitchell, S. Dak.
Filed Oct. 28, 1968, Ser. No. 771,140
Int. Cl. A61f *5/02*
U.S. Cl. 128—78 **1 Claim**



An orthopedic appliance including a flexible and elastic body-engageable and conformable belt having a pressure pad slidably mounted on the inner side thereof for application on the torso of the wearer to provide support and pressure in any preselected position on the circumference of the torso between the lower scapular area and the sacroiliacs.

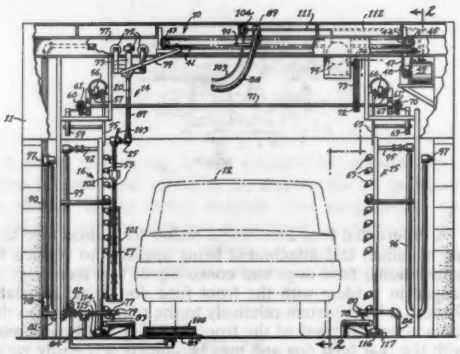
3,578,774
UROLOGICAL ENDOSCOPIC IRRIGATION MACHINE
Harold P. McDonald, Jr., Garden City, N.Y. (University of Tenn. College of Medicine, Urology Dept. 858 Madison Ave., Memphis, Tenn. 38103)
Filed Aug. 7, 1969, Ser. No. 848,170
Int. Cl. A61m *7/00*
U.S. Cl. 128—227 **8 Claims**

A urological endoscopic irrigation machine which consists of a cabinet for holding tank of irrigation fluid which is pumped through a tube into a reservoir bag at an elevated height. A membrane filter is connected on the input of the bag to filter out bacteria from the irrigant pumped from the tank. The bag is supported from a weight-sensitive switch which is responsive to the weight of the bag and its contents so that, as the fluid level in the bag drops, the weight-sensitive switch will automatically operate the pump to refill the



bag to a predetermined level so as to maintain its constant supply of irrigation fluid for the patient.

3,578,775
VEHICLE-WASHING APPARATUS
James W. McMillen, 2011 Belmont Blvd., Nashville, Tenn.
Filed Feb. 20, 1969, Ser. No. 800,904
Int. Cl. B60s *3/04*
U.S. Cl. 134—45 **10 Claims**

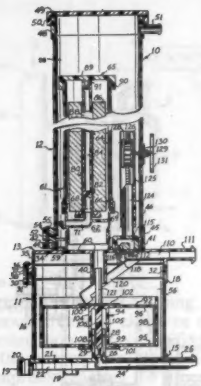


A vehicle-washing apparatus having a longitudinally disposed overhead spray frame supporting longitudinally spaced spray heads for reciprocable movement transversely above a vehicle to be washed, and a pair of vertically disposed side frames supporting vertically spaced side spray heads and mounted for reciprocable movement longitudinally along opposite sides of the vehicle. The overhead frame may include depending end frames having vertically spaced end spray heads for washing the opposite ends of the vehicle, and the overhead spray heads may be arranged at different elevations to define the contour of the vehicle.

3,578,776
CHEMICAL FEEDER
Thomas E. Schneider, Jr.; Marion R. Carstens, Atlanta, and Homer J. Bates, Roswell, Ga., assignors to Tesco Chemicals, Inc., Atlanta, Ga.
Continuation-in-part of application Ser. No. 579,253, Sept. 14, 1966, now Patent No. 3,057,624, which is a continuation-in-part of application Ser. No. 403,968, Oct. 12, 1964, now Patent No. 3,323,539. This application Aug. 22, 1968, Ser. No. 754,535
Int. Cl. B01d *11/02*
U.S. Cl. 137—268 **9 Claims**

A chemical feeder for feeding a chemical from a solid chemical compound into a stream of water. The feeder in-

cludes a housing divided into upper and lower chambers, a chemical container positioned in the upper chamber for receiving a solidified chemical compound, a liquid inlet conduit communicating with the upper chamber, a liquid exhaust conduit communicating with the lower chamber, valves controlling both conduits, and a float positioned in the lower chamber for operating both valves. The chemical container

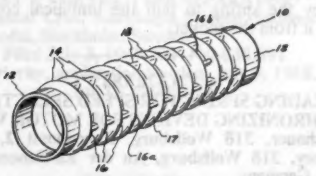


includes a plurality of apertures at spaced intervals about its lower end, and a nozzle extending inwardly from its lower end for flowing liquid from the upper chamber into contact with the solidified chemical compound and eroding the compound from its lower end. The mixture of the liquid and chemical compound flows from the upper chamber to the lower chamber.

3,578,777
CORRUGATED TUBING

William J. DeGain, Warren, Mich., assignor to Koppy-Tool Corporation, Ferndale, Mich.

Filed June 11, 1969, Ser. No. 832,352
Int. Cl. F16l *9/06, 11/12*
U.S. Cl. 138—121 **28 Claims**



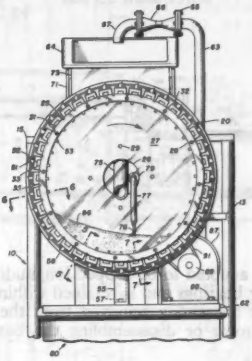
A corrugated tubing in which either the corrugation peak or root portions respectively and selectively are provided with longitudinal annularly spaced depressions or bulges connecting adjacent corrugation surfaces and in which selected peak or root diameters selectively may be different than the remaining peak or root diameters, such tubing when used as an energy-absorbing device having thereby a predetermined resistance of the corrugations to axial collapse loads and producing controlled degree and order of their collapse on subjecting the tubing to such axial loads.

3,578,778
PACKAGING APPARATUS FOR FILLING INDIVIDUAL CONTAINERS

Ernest L. Matthews, and Ralph E. Matthews, Decatur, Ala., assignors to Matthew Machine Company, Inc., Decatur, Ala.

Filed Mar. 7, 1969, Ser. No. 805,149
Int. Cl. B65b *43/42;* **B67c** *3/00*
U.S. Cl. 141—144 **3 Claims**

A high productivity packaging apparatus and method are based on utilization of a container and a plurality of circular arranged valves which are connected to and rotate with the container. During rotation each valve draws a unit of material to be packaged from the container at one station, holds the

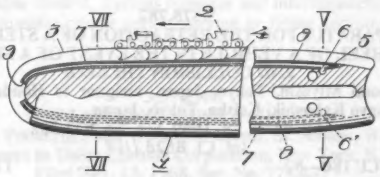


unit of material in the valve during continuing rotation and then discharges the unit of material at a discharge station to which empty containers are fed successively in synchronism with successive valves being discharged.

3,578,779
BAR FOR A CHAIN SAW

Kan Ishizaki, Tokyo, Japan, assignor to Shingu Shoko, Ltd., Otaru, Hokkaido, Japan

Filed Jan. 28, 1969, Ser. No. 794,659
Int. Cl. B27b *17/02, 17/12*
U.S. Cl. 143—32 **1 Claim**



The present invention discloses a bar for a chain saw comprising a pair of parallel guide rails for a saw chain, a circumferential groove provided between said pair of guide rails and extending therealong, and an oil supply means having one or more ports facing to said groove, wherein a cover plate extending from one of said opening to a top portion of the bar is fixedly mounted within said groove and along a bottom portion thereof, thereby forming an oil passage, and oil supplied into the oil passage through said opening by the oil supply means can be discharged into the guide groove at the top portion of the bar.

3,578,780
APPARATUS FOR COMMINUTING MATERIALS

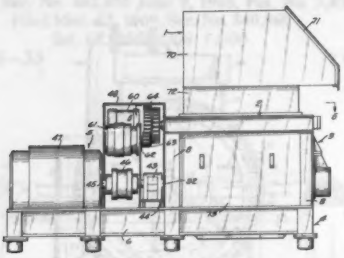
Norman J. Peters, Fond Du Lac, Wis., assignor to DEC International, Inc., Madison, Wis.

Filed Dec. 30, 1968, Ser. No. 787,805
Int. Cl. B02c *18/00;* **B26d** *9/00*
U.S. Cl. 146—79 **16 Claims**

An apparatus for comminuting and blending materials such as food products. The materials to be blended are initially fed into a shredder unit and the shredded materials are discharged to a comminuting or grinding unit.

The grinding unit includes a rotor which rotates within a perforated drum having a generally U-shaped cross section

and open ends. The material is introduced into the drum through the longitudinally extending opening and is forced outwardly through the perforations by the rotor and discharged to a hopper.



The drum is adapted to be slipped longitudinally over the rotor and rotor bearings and is retained within a fixed cage. The drum can be readily removed from the unit without removing the rotor or disassembling the bearings for the rotor shaft.

3,578,781

CLAY TREATING AND OIL-WETTING DISPERSION AND METHOD OF USE THEREOF

Albert Abrams; Harold J. Hill, and David R. Thigpen, Houston, Tex., assignors to Shell Oil Company, New York, N.Y.

Filed Dec. 31, 1968, Ser. No. 789,002
Int. Cl. E21b *43/25*
U.S. Cl. 166—305 **6 Claims**

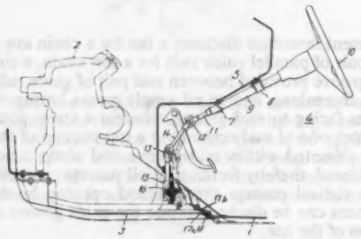
Permeability characteristics of a subterranean earth formation are improved by permeating them with a clay treating and oil-wetting dispersion of a surface active salt of a surface active cation and a surface active anion in an aqueous liquid solution containing electrolyte and water-soluble surfactant.

3,578,782

APPARATUS FOR THE RETRACTION OF A STEERING WHEEL OF A VEHICLE IN THE EVENT OF A FRONT END COLLISION THEREOF

Takeomi Miyoshi, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1969, Ser. No. 872,302
Int. Cl. B62d *1/18*
U.S. Cl. 180—82 **11 Claims**



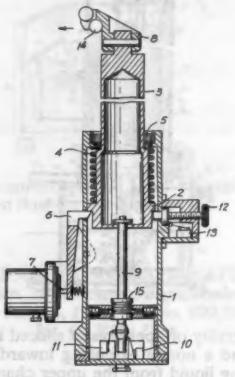
A steering wheel is connected to a shaft which in turn is connected to a steering mechanism in a housing so as to provide a steering connection, the housing being supported on a support frame which extends forwardly from the car body frame and is connected therewith along an inclined surface so that if the support frame is displaced rearwardly in the event of front end collision, the support frame is lowered where it is connected with the housing to cause the latter to be lowered and in turn cause the steering shaft to be retracted from the passenger compartment. The support frame may also be provided with a downwardly bent portion to achieve lowering of the housing and retraction of the shaft and steering wheel.

3,578,783

EXTRACTOR FOR AN UMBILICAL CONNECTOR OF A ROCKET

Pierre Loustalet, and Guy Roujas, Tarbes, France, assignors to The French State, France

Filed Nov. 5, 1969, Ser. No. 874,344
Claims priority, application France, Nov. 5, 1968, 172,592
Int. Cl. F03g *1/00;* **F15b** *15/26*
U.S. Cl. 185—37 **10 Claims**



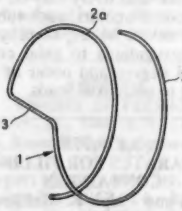
An extractor for an umbilical connector of a rocket comprises a hook of a piston rod engaging the connector, the piston rod being connected to a piston which is loosely fitted in a cylinder. A lock member engages the piston to hold the same in a ready or armed position in which a spring is compressed between the piston and cylinder. In a first mode of operation, a command signal is given to retract the lock member whereupon the piston is displaced by the spring and the hook pulls the umbilical connector to separate it from the rocket. In a second mode of operation, the hook remains in place and during rocket lift-off the umbilical connector tilts the piston past the lock member whereupon the piston is displaced by the spring to pull the umbilical connector and separate it from the rocket.

3,578,784

SPREADING SPRING FOR SPEED SELECTION AND SYNCHRONIZING DEVICES FOR MOTOR VEHICLES

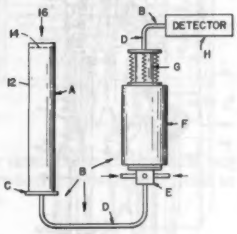
Karl Ashauer, 318 Wolfsburg, Rabenhorst 2, and Dieter Manthey, 318 Wolfsburg, An der Kirchmesse 14, Wolfsburg, Germany

Filed Nov. 26, 1969, Ser. No. 880,120
Int. Cl. F16d *23/02*
U.S. Cl. 192—53R **4 Claims**



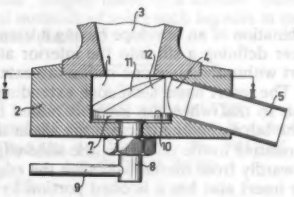
An annular-shaped spreading spring for speed selection and synchronizing devices for motor vehicles consisting of an integral wire with two winding loops interconnected by a crossover sector.

3,578,785
OUTLET PLUG AND CONDUIT FOR CHROMATOGRAPH
James A. Patterson, Los Altos, Calif., assignor to Sondell Research & Development Co., Palo Alto, Calif.
Filed Feb. 12, 1968, Ser. No. 707,016
Int. Cl. B01d 15/08
U.S. Cl. 210—198 11 Claims



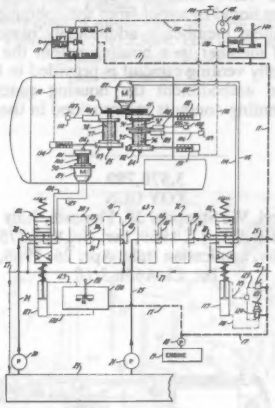
A chromatographic conduit forming a channel through which a continuous stream of eluate or classified fluids pass with minimal destruction of the classified state. The conduit commences at the output of a chromatographic classifying column and comprises reactors for processing the classified fluids, interconnecting tubes for transporting the classified fluids, and plugs for accommodating unavoidable changes in overall conduit cross section. The reactor and plugs define fluid-containing volumes, which volumes are packed with spherical particles to define intercommunicating spaces therein. These defined intercommunicating spaces prevent the fluid interfaces contained within the eluate from being dispersed over large and unobstructed areas wherein mixing due to turbulence and molecular migration may freely take place. The conduit, including the interconnecting tubing and reactor, is provided throughout with an essentially constant, effective cross-sectional area for fluid flow, which area permits uniform velocity in the fluid stream and gradual and uniform pressure drop therethrough.

3,578,786
DISCHARGE DEVICE FOR THE BOTTOM FRACTION AT A VORTEX-TYPE SEPARATOR
Ake Karl Gustaf Cras, Karlskoga, Sweden, assignor to Karl Arvid Skardal, Stockholm, Sweden
Filed July 3, 1969, Ser. No. 838,891
Claims priority, application Sweden, July 9, 1968, 9460
Int. Cl. B04c 5/16
U.S. Cl. 210—512 5 Claims



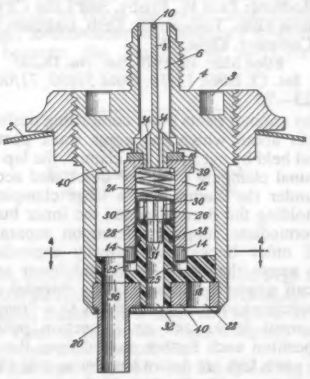
A device is provided for discharging the heavy bottom or reject fraction from a vortex-type separator and the device comprises a cylindrical vortex chamber which is connected to a bottom fraction outlet of the separator so as to receive the reject fraction therefrom in a manner producing a vortex flow in the vortex chamber. The vortex chamber is provided with an outlet port for the reject fraction and a flow-deflecting member is disposed within the vortex chamber for deflecting the vortex flow away from the circumferential wall of the vortex chamber at the location of the outlet port. The flow-deflecting member has an adjustable position in the vortex chamber so that the degree of deflection of the vortex flow from the location of the outlet port is determined by the position of the flow-deflecting member.

3,578,787
CONTROL SYSTEM
Alan E. Brickett, and Everett R. Windahl, Green Bay, Wis., assignors to Northwest Engineering Corporation, Green Bay, Wis.
Filed Nov. 12, 1968, Ser. No. 774,772
Int. Cl. B66c 23/06
U.S. Cl. 212—59 5 Claims



A control system for a convertible pullshovel-crane wherein a plurality of hydraulic cylinders and/or hydraulic motors are actuated by a combination of air cylinders and hydraulic valves. In one embodiment, booster means for some of the hydraulic cylinders are provided with interlocks to prevent booster operation under certain conditions. In another embodiment, a plurality of hoist drums are controlled by the hydraulic motors, with the drums having both friction brakes as well as friction clutches to provide flexibility of cable control. Various bypasses and interconnections in the pneumatic circuit permit varying or fixing certain drum speeds.

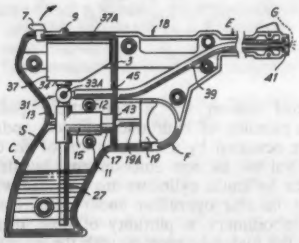
3,578,788
GAS LIQUID WITHDRAWAL VALVE
John J. Potter, Jr., and William J. Hamel, St. Albans, W. Va., assignors to Union Carbide Corporation, New York, N.Y.
Filed Nov. 13, 1968, Ser. No. 775,427
Int. Cl. B67b 7/24
U.S. Cl. 222—4 5 Claims



A device is provided for attachment to the opening on top of a pressurized container and adapted to selectively

withdraw liquid or gas therefrom. It comprises a valve body adapted to be fitted to the opening of a container. The valve body is fitted with a disc valve having one or more openings which may be selectively rotated to vent either a tubular member extending from the valve body into the container so as to withdraw liquid, or an opening in the base of the valve body communicating with the gas above the liquid. A plunger, biased by a double-acting resilient member such as a spring, is provided in the top of the valve in order to externally vent the valve after the disc has been rotated to withdraw either liquid or vapor from the container. The double-acting resilient member is additionally biased against a pressure relief member in a housing within the valve body and an externally venting conduit is provided in the housing. In a preferred embodiment the housing coacts with the plunger and venting conduits are provided in the base of the plunger.

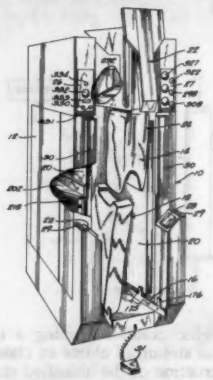
3,578,789
TOY GUN
Giampiero Ferri, Via Stoppani 38, Florence, Italy
Filed Apr. 11, 1969, Ser. No. 815,375
Claims priority, application Italy, Apr. 26, 1968, 4540A/68
Int. Cl. A63h *3/18*
U.S. Cl. 222—79 **13 Claims**



A water pistol which includes a main liquid reservoir formed in a part of the casing, a trigger-actuated pump for withdrawing liquid from the main reservoir, and a pressurized liquid reservoir mounted within the main reservoir. A three-way valve is connected between the pump and the pressurized reservoir to selectively supply liquid from the pump to the pressurized liquid reservoir, from the pump to the nozzle of the gun and to the pressurized liquid reservoir, or from the pressurized liquid reservoir to the nozzle.

3,578,790
CABINET PANTS PRESS
David L. Radford; Paul W. Frisby, Salt Lake City, and Francisco Muniz Filho, Taylorsville, Utah, assignors to McGraw-Edison Company, Elgin, Ill.
Filed Mar. 10, 1970, Ser. No. 18,215
Int. Cl. D06c *15/10;* **D06f** *59/00, 71/00*
U.S. Cl. 223—73 **24 Claims**

A one lay cabinet pants press comprising nested outer and inner bucks about which the pants waist portion can be dressed and held by overlying lap clamps, the lap clamps having a nominal clamping force for quick and accurate pants dressing under the clamps and a large clamping force for securely holding the dressed pants, the inner buck having a single intermediate support whereupon separation of the inner and outer bucks automatically expands the pants uniformly across the upper waist and lower seat portions thereof, cuff grippers and supporting parallel arm linkage therefor suitable to move the grippers to a dressing position near the waist bucks and an inspection position and a pressing position each further spaced from the waist bucks where the pants legs are drawn lengthwise and a brake device across the linkage effective to hold the pants legs as drawn, carriage support for the waist bucks, another parallel arm linkage supporting the grippers aligned with the waist bucks, structure connecting the carriage support and other linkage together suitable for moving them as aligned in unison between an outer dressing position and an inner pressing position, a fly press carried by the waist bucks to move



between a dressing position offset from the buck and a pressing position opposing the buck, and structure tying this movement of the fly press in unison to the buck carriage support.

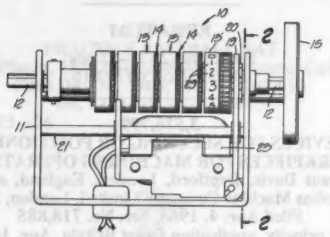
3,578,791
ENVELOPE OPENER AND ADVERTISING PIECE
George W. Davis, 1379 Venetian Way, Miami, Fla.
Filed Mar. 2, 1970, Ser. No. 15,604
Int. Cl. B65d *27/32;* **B43m** *7/00*
U.S. Cl. 229—85 **3 Claims**

The combination of an envelope having a triangular cutout at one corner defining a slit into the interior at the corner, and an insert within the envelope with a tab extending out of the corner. The insert has a slice edge extending at an angle from the tab so that when the insert is pulled from the envelope by the tab extending through the slit in the corner as it is pulled relative to the envelope, the slide edge which extends downwardly from the tab will slice the edge of the envelope. The insert also has a hooked portion to loosely captivate a piece of planar material in the hooked portion to be dragged from the envelope when the insert is removed from the envelope to drop free and to catch the attention of the recipient of the envelope as it falls.

3,578,792
DECADE COUNTER OR THE LIKE
John J. Affel, Canoga Park, Calif., assignor to International Telephone and Telegraph Corporation
Filed May 20, 1969, Ser. No. 826,131
Int. Cl. G06c *15/42*
U.S. Cl. 235—144 **9 Claims**

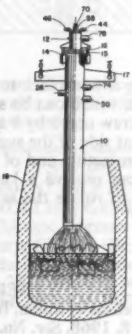
The invention includes, for example, a number wheel and a gearwheel. Both wheels have a star-shaped ratchet around

which a leaf spring fits. The spring holds the wheels together. The number wheel, thus, normally advances with the



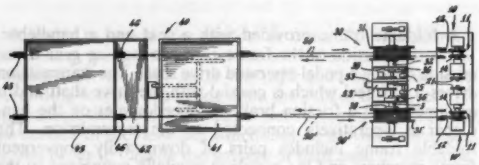
gearwheel. For reset, the number wheel may be turned relative to the gearwheel and the spring yields to allow such relative movement.

3,578,793
VARIABLE FLAME OXY-FUEL BURNER
Robert D. Jones, and Keith A. Miller, Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.
Filed May 29, 1968, Ser. No. 733,100
Int. Cl. B05b *15/00*
U.S. Cl. 239—132.3 **6 Claims**



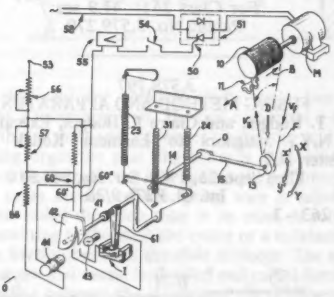
An oxy-fuel burner for use in a metallurgical furnace is disclosed which can be controlled to regulate the configuration of the burner flame to provide a flame shape varying from a wide "umbrella" shaped flame to a narrow "pencil" shaped flame. Several methods of using such burners in metallurgical furnaces are also disclosed.

3,578,794
SPOOLING APPARATUS
Edward E. Laird, 18 Pine Orchard Road, Branford, Conn.
Filed Jan. 16, 1969, Ser. No. 791,585
Int. Cl. B65h *54/00*
U.S. Cl. 242—25 **11 Claims**



Unitary apparatus for precisely winding wirelike material from a large payoff reel to a takeup spool having an arrangement of operating elements and control circuits to enable a battery of these units to be operated by a single operator. The arrangement of elements permits of a treating means such as cleaning being interposed between the payoff reel and takeup spool.

3,578,795
COP WINDER WITH CONTROLLED YARN TENSION
Gaspare Polese, Padua, Italy, assignor to Utita Officine E Fonderie Di Este S.P.A., Padua, Italy
Continuation-in-part of application Ser. No. 563,440, July 7, 1966, now Patent No. 3,412,949. This application July 12, 1968, Ser. No. 744,429
Int. Cl. B65h *59/38*
U.S. Cl. 242—45 **8 Claims**



A yarn feeler means for a yarn winder includes a dancer pulley carried by a pivotally supported arm pivotal about the axis of a mounting shaft, the dancer pulley being engaged in a loop of the yarn in advance of the yarn-winding means. Spring means are connected to the shaft to apply an essentially uniform torque thereto and tension to the looping arm. The yarn winder is driven from a variable speed motor supplied by a supply circuit including supply adjusting means operable responsive to the actual position of the dancer pulley and arm to provide a supply proportional to the actual position to compensate for differences between the yarn-feeding speed and the yarn-winding speed. An auxiliary supply control circuit is effective, when closed, to boost the adjustment of the supply, and includes a movable contact supported by an arm fixedly connected to the shaft and movable within an arc of small amplitude, the movable contact, upon movement of the dancer pulley and arm in one given direction, engaging a fixed contact to close the auxiliary control circuit to boost the motor supply, such as the motor voltage, to counteract any tendency to increasing the difference between the yarn-feeding and yarn-winding speeds.

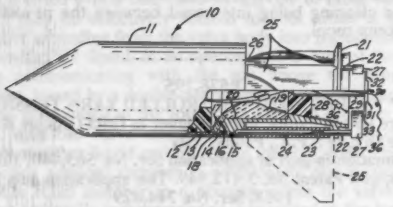
ERRATUM

For Class 243—797 see:
Patent No. 3,579,244

3,578,796
SPINNING AND STABILIZING SYSTEM FOR SOLID PROPELLANT ROCKET OR MISSILES
Travis J. Hagler, Huntsville; William R. Puckett, Trinity, and Bobby G. Tanner, Huntsville, Ala., assignors to Thiokol Chemical Corporation, Bristol, Pa.
Filed Sept. 25, 1968, Ser. No. 762,491
Int. Cl. F42b *13/32*
U.S. Cl. 244—3.23 **3 Claims**

A system for imparting a spin force to a solid propellant rocket while it is in a launch tube, and to stabilize the solid

propellant rocket to discontinue the spin force after it leaves the launch tube.



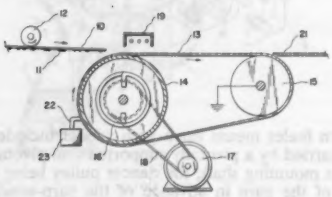
ERRATUM

For Class 251—41.9 see:
Patent No. 3,579,270

3,578,797
FUSING METHOD AND APPARATUS

Howard T. Hodges, and Claire F. Hodges, Executrix, Perinton, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 26, 1969, Ser. No. 861,510
Int. Cl. F27b *9/28*
U.S. Cl. 263—3 9 Claims

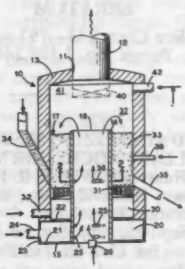


A toner image is fused to a receiver sheet without substantial heating of the sheet by placing the sheet, image side down, on an endless heat-conductive web extending around at least two spaced rotatable supports. One or more of these rotatable supports may include a heating element to heat the endless web at or adjacent to the point where the receiver sheet is brought into contact therewith. A corona charger may be used to tack the receiver to the endless web to assure positive contact therebetween.

3,578,798
CYCLONIC FLUID BED REACTOR

Walter C. Lapple, and Edward M. Poole, Alliance, Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed May 8, 1969, Ser. No. 823,056
Int. Cl. F27b *15/02*
U.S. Cl. 263—21 9 Claims



A high capacity fluidized bed unit is formed of single or multiple stages where reaction products may be maintained out of contact with gaseous products of combustion used to provide heat for the reaction.

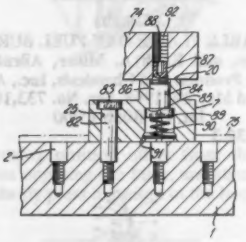
ERRATUM

For Class 263—52 see:
Patent No. 3,579,616

3,578,799
DEVICES FOR SECURING OR POSITIONING WORKPIECES FOR MACHINING OPERATIONS

Peter Grant Davis, Deptford, London, England, assignor to The Molins Machine Company Limited, London, England

Filed Apr. 4, 1968, Ser. No. 718,885
Claims priority, application Great Britain, Apr. 14, 1967, 17,248/67
Int. Cl. B23q *3/02*; F16b *41/00*
U.S. Cl. 269—51 3 Claims

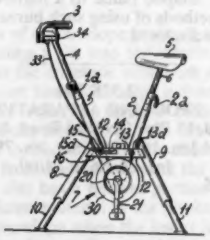


A device for securing a workpiece to a pallet comprises a hollow support element, which can be screwed to the pallet, and which contains a screw urged by a spring to project from a support surface on that side of the support element remote from the pallet. The projecting end of the screw has a hexagonal recess which can receive a key inserted through a hole in the workpiece to rotate the screw and thread it up into the workpiece.

3,578,800
FOLDABLE BICYCLE-TYPE EXERCISING DEVICE

Paolo DiNepi, Via Crocefisso 6, Milan, Italy

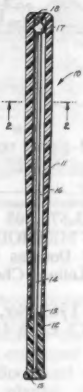
Filed Oct. 8, 1968, Ser. No. 765,894
Claims priority, application Italy, Oct. 13, 1967, 815,374
Int. Cl. A63b *21/00, 23/04*
U.S. Cl. 272—73 7 Claims



A foldable frame provided with a seat and a handlebar. The lower portion of the frame carries a step-up gear transmission having a pedal-operated drive shaft. The transmission drives a flywheel which is coaxial with the drive shaft and is equipped with a friction brake. A speedometer on the handlebar is operatively connected to the transmission. The foldable frame includes pairs of downwardly convergent frame members and leg members pivotally connected to the frame members, and a pair of transversely spaced straps straddling the frame and leg members. One leg member is rigidly secured to the straps at one end thereof, the other end portions of the straps are provided with longitudinal slots, a

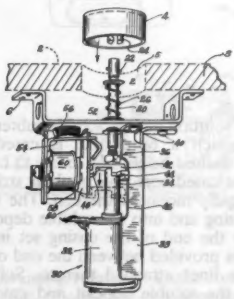
pivot extends through the slots and connects the other leg member and one of the frame members to the straps, and a second pivot connects the other frame member to the straps.

3,578,801
PRACTICE BASEBALL BAT
Raymond Piazza, 15402 Flagstaff St., La Puente, Calif.
Filed Dec. 30, 1968, Ser. No. 787,670
Int. Cl. A63b *59/06, 69/40*
U.S. Cl. 273—26 **4 Claims**



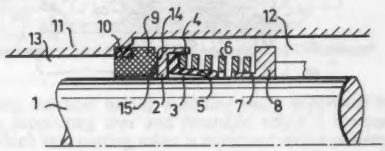
A hollow bat for baseball practice having an internal longitudinal rod and movable weight which will increase the inertia of the bat during the swing.

3,578,802
VERTICALLY ADJUSTABLE BUMPER FOR BALL ROLLING GAMES
Frank T. Murphy, Chicago; Norman R. Clark, Oak Lawn, and William E. Casey, Chicago, Ill., assignors to Williams Electronic Manufacturing Corporation, Chicago, Ill.
Filed Feb. 25, 1969, Ser. No. 802,160
Int. Cl. A63b *71/00*
U.S. Cl. 273—129 **3 Claims**



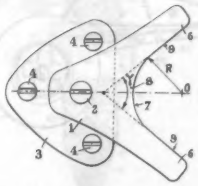
In order to provide for random or controlled variations in ball-rolling games, which include a ballfield and means for causing balls to enter upon the field and engage elements permitting scoring depending upon the skill of the player, this application discloses a bumper which is normally flush with the surface of the field, but which may be moved by that surface in order to impede the passage of balls used in the game. The bumper may be arranged to have its movement controlled in a random fashion or may be arranged to be subject to the ability of a game player to direct the passage of the ball. A solenoid is used to retract the bumper to its flush position in which it is held by a latch which may be released by energizing a coil.

3,578,803
SLIDE-RING SEAL
Dieter Karl Wilhelm Huhn, Lagmansuagen 9, Vallentuna, Sweden
Filed Feb. 13, 1969, Ser. No. 798,869
Claims priority, application Sweden, Feb. 15, 1968, 1,981/68
Int. Cl. F16j *15/34*
U.S. Cl. 277—85 **5 Claims**



A slide-ring seal for rotating shafts seals two spaces separated by a transverse wall. The seal comprises a seal ring rotating with the shaft and a counter-ring in the said wall. A helical spring urges the seal ring towards the counter-ring. An O-ring or sleeve seals the ring against the periphery of the shaft. The cross section of the spring wire is substantially greater in its radial direction than in its axial direction, the spring transmitting to the shaft the entire or a substantial part of the slide friction between the slide surfaces. The spring is of conical shape and exerts both axial and radial forces so as to effect sealing between the sleeve and the periphery of the shaft also.

3,578,804
SAFETY ABUTMENT OF SKI BINDING
Jean Joseph Alfred Beyl, 10, blvd. Victor Hugo, Nevers, France
Filed Dec. 16, 1968, Ser. No. 783,843
Claims priority, application France, Dec. 29, 1967, 134,220
Int. Cl. A63c *9/00*
U.S. Cl. 280—11.35T **3 Claims**

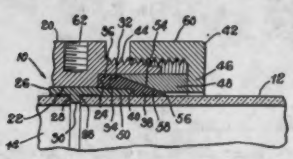


A safety abutment of a front ski safety binding for coacting with the rounded toe end of a ski boot upper instead of with the sole portion thereof, the abutment device being so designed that it can coact with ski boots of different designs and sizes.

3,578,805
TUBE COUPLING
Lloyd K. Dutton, West Paterson, N.J., assignor to Mooney Brothers Corporation, Little Falls, N.J.
Filed Mar. 5, 1969, Ser. No. 804,581
Int. Cl. F16l *9/14*
U.S. Cl. 285—55 **4 Claims**

A tube coupling for coupling tubes capable of carrying corrosive fluids, the tube coupling employing an outer body of relatively rigid, high strength material, an inner tubular member of a resiliently deformable, generally inert, corrosion resistant material such as a fluorocarbon resin received within the outer body and having a bore for receiving a tube therein, an annulus of elastomeric material having a first por-

tion placed around the inner tubular member adjacent an end thereof and a second portion extending beyond the end of the inner tubular member, the annulus retaining the inner tubular member within the outer body against inadvertent removal therefrom, a nut threaded onto the outer body and means coupling the nut and the annulus such that upon threading the nut along the outer body the coupling means



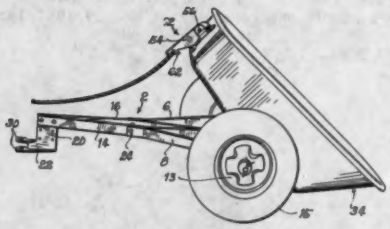
will axially contract the annulus to radially contract the inside diameter of the first portion of the annulus and thereby deform the inner tubular member radially inwardly to grip the tube therein and establish a seal between the inner tubular member and the tube therein and to radially contract the inside diameter of the second portion of the annulus and thereby grip the tube therein in response to axial movement of the threaded member.

3,578,806

TRAILER AND UNDERCARRIAGE THEREFOR

Roger R. Tonelli, Chicago, Ill., assignor to Radio Steel & Mfg. Co., Chicago, Ill.

Filed Feb. 14, 1969, Ser. No. 799,179
Int. Cl. B60p *1/24*
U.S. Cl. 298—2 **5 Claims**



A trailer having an undercarriage formed from flat strip material which has an adjustable hitch on its front end and carries a self-dumping dump body is provided. A latch on the dump body is engageable with a cooperating member and need not be accurately registered therewith.

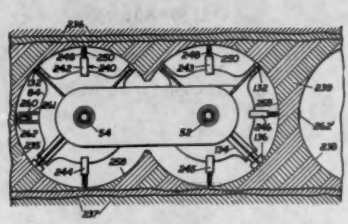
3,578,807

METHOD OF STEERING

Arthur Lee Barrett, 2928 Lothair Way, Michigan City, Ind.

Original application July 11, 1966, Ser. No. 570,109, now Patent No. 3,421,796, which is a continuation-in-part of application Ser. No. 202,642, June 11, 1962, now abandoned , which is a continuation-in-part of application Ser. No. 751,316, June 28, 1958, now abandoned. Divided and this application Nov. 5, 1968, Ser. No. 773,584
Int. Cl. E21c *35/08*
U.S. Cl. 299—1 **10 Claims**

A method of maintaining a desired distance between a steerable earth strata mining means and a laterally adjacent bore. A signal-reflecting means is placed at a known location along the bore. The mining means includes means to emit signals toward the reflecting means and another means to receive a portion of the original signal which is reflected by the reflecting means. The mining means is steered in



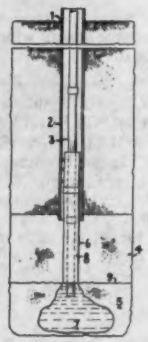
response to the reflected signal received by the receiving means.

3,578,808

SOLUTION MINING METHOD AND APPARATUS

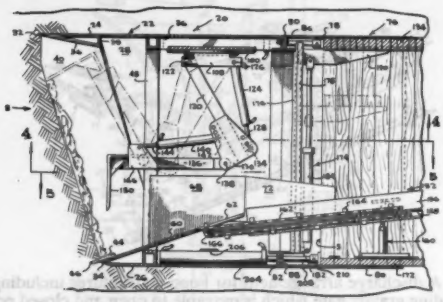
Byron P. Edmonds, and Douglas C. Ruse, Saskatchewan, Canada, assignors to Kolium Chemicals Limited, Regina, Saskatchewan, Canada

Filed Jan. 14, 1969, Ser. No. 790,935
Int. Cl. E21b *43/28*
U.S. Cl. 299—4 **12 Claims**



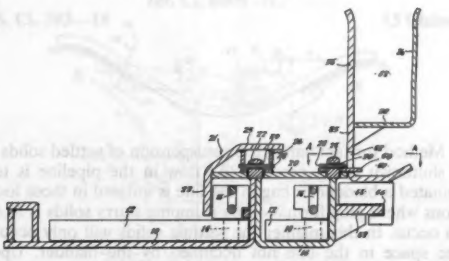
A method of solution mining soluble subterranean deposits is shown in which a bore hole is cased to the depth equivalent to a desired height of a cavity to be developed in a deposit. Into the cased bore hole a tubing string is introduced with a liner rigidly mounted thereon. The tubing is passed through the casing and into the soluble deposit a substantial distance below the end of the casing set in the deposit. A fixed distance is provided between the end of the tubing and the end of the liner attached thereto. Solvent is then introduced into the soluble deposit and cavity development begun by dissolution of the minerals in the deposit with a suitable solvent. When lateral development of the cavity has proceeded to the desired extent, roof raises are made by moving the tubing string in a vertical direction upward from ground level. The fixed liner moves with the tubing string since it is rigidly mounted thereto. Thus, a fixed mining distance is maintained between the influent point for the solvent entering the soluble deposit and the effluent or withdrawal point. Roof raises can be accomplished in this manner as fixed distances until the liner is finally introduced into the casing by the vertical movement of the tubing toward the ground surface. The apparatus involved in conducting the novel method of the invention is also disclosed.

3,578,809
METHOD AND APPARATUS FOR FORMING SUBTERRANEAN STRUCTURES
Vernon Cunningham, P.O. Box 9337 Springhill Station, South Charleston, W. Va.
Filed May 9, 1969, Ser. No. 823,407
Int. Cl. E21d 23/00
U.S. Cl. 299—33 4 Claims



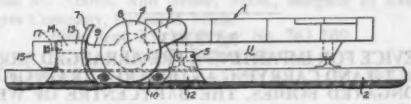
A multisection shield incorporates means for subterranean excavation and for conveyance of excavated materials and provides for the installation of the lining planks within the shield. This apparatus is employed in a system of tunnel or conduit lining wherein floor and roof planks are prepositioned and sidewall planks are wedged in place therebetween.

3,578,810
CABLE HANDLER TROUGHS
Gordon Newstead, Moorside, Durham, England, assignor to R. B. Bolton (Mining Engineers) Limited, Durham, England
Filed July 24, 1969, Ser. No. 844,279
Claims priority, application Great Britain, July 30, 1968, 36316/68
Int. Cl. E21c 35/20
U.S. Cl. 299—43 4 Claims



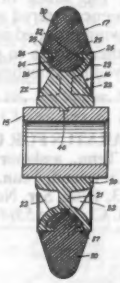
The present invention relates to chain conveyors for conveying bulk material, wherein the conveyor has mounted to it and extending along its length a trough for cables used in the operation of the conveyor. A tongue and an upstanding pin are provided on a fixed portion of the conveyor, and a slot to receive the tongue is provided on the trough. A locking plate extends through an aperture in an upright portion of the trough and over the pin. Shoulders on the plate engage the sides of the portion adjacent the aperture. A split dowel passes through the pin to retain the plate on the pin. The plate holds the trough in position on the tongue, but can be easily removed without disturbing the trough. The invention is particularly applicable to a conveyor used at a mining face, wherein the open-top trough contains power cables for the travelling cutter.

3,578,811
ROLLER CUTTER
Friedrich-Karl Bassier, Eppinghoven/uber, Dinslaken, and Hans Tekathen, Dinslaken Niederrhein, Germany, assignors to Gebr, Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Germany
Filed Aug. 6, 1969, Ser. No. 847,964
Claims priority, application Germany, Aug. 10, 1968, P 17 58 809.9
Int. Cl. E21c 27/24, 35/20
U.S. Cl. 299—45 3 Claims



A mining machine having a cutting roller supported by a pivotable supporting arm and rotatable about a horizontal axis, in which said cutting roller is equipped with a conveying shield pivotable about the axis of said roller while a ramp is connected to the machine carriage and ascends from the floor of the seam of the rock being mined to the upper edge of the long wall conveying means, both ends of said ramp carrying confining walls curved in conformity with the curvature of the conveying shield and arranged adjacent one edge of said shield, said confining walls in either one of two end positions of said conveying shield closing off the space between the conveying shield and the long wall conveying means.

3,578,812
SUPPORT WHEEL AND METHOD OF MAKING SAME
Frederick Taussig, Ladue, and Robert Gene Tanner, St. Charles, Mo., assignors to Arundale Manufacturers, Inc., St. Louis, Mo.
Filed Mar. 3, 1969, Ser. No. 803,853
Int. Cl. B60b 5/02
U.S. Cl. 301—63 10 Claims



The inventions are a support wheel assembly and a method of making it. The support wheel comprises a central bearing, a circular elastic tire, and a plastic wheel interposed between the bearing and tire. The tire has opposite circular clincher grooves on its sides and locking knobs on its inner wall. The plastic wheel is molded around the bearing, into the grooves, and around the knobs.

The method involves locating the tire, and usually the bearing, as inserts in a mold cavity, the tire being compressed at opposite sides adjacent the rim, causing it to be temporarily reduced in width, and to bulge inward at the clincher grooves. Plastic to form the wheel is injected under pressure through at least three equally spaced gates in the hub portion of the mold cavity. The plastic flows around the bearing insert, if present, then outwardly to form a wheel web, until it strikes an arcuate inner wall of the tire. It is thereby evenly divided to flow outwardly and laterally to form the wheel rim. At the edge of the rim it is deflected laterally into the clincher grooves of the precompressed tire to form a circular clincher bead therein, and also around the edge of the rim to

form a peripheral outer ridge. It flows around the knobs, or similar projections, on the inner wall of the tire and interlocks therewith.

The inward compression of the walls of the tire aids in preventing flow of the plastic up the sides of the tire, and, if the mold is designed in a manner herein disclosed, permits the formation of the ridges around the wheel rim adjacent the sides of the tire. A two-piece core and cavity mold is employed, the separations being located at the maximum outward extremes of the wheel, to vent air from the mold. Upon removal from the mold, the tire is snug on the wheel, and the wheel is shrunk or bonded to the bearing, if present.

3,578,813

DEVICE FOR IMPARTING A PRE-ARRANGED ARRAY TO AND CARRYING AN ORDERLY TRAIN OF ELONGATED BODIES, THE BARYCENTRE OF WHICH BEING ADJACENT AND END THEREOF

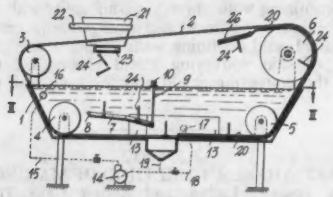
Tomaso Ruscitti, Via Amedeo D'Aosta, 11, Milan, Italy

Filed July 17, 1968, Ser. No. 745,527

Claims priority, application Italy, Aug. 5, 1967, 19277/67

Int. Cl. B65g *53/30*

U.S. Cl. 302—14 **6 Claims**



Device for imparting a vertical array and conveying along guide means drawing tubes applied on valves to be attached on aerosol containers, the device comprising a container from which the tubes are caused to randomly drop on a moving belt provided with perforated housings or slots. Prior to dropping on the belt, the tubes orientate in a vertical direction due to friction encountered with the fluid in which they move and, once having dropped into the belt housing or slot, they are retained therein due to suction exerted below the belt and then conveyed to collecting guides.

3,578,814

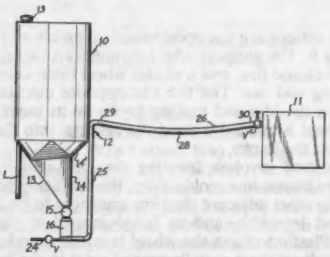
METHOD AND APPARATUS FOR CONVEYING DUST

Percy E. Todd, Apison, Tenn., assignor to Percy Todd Manufacturing Company, Cleveland, Tenn.

Filed Sept. 3, 1968, Ser. No. 756,820

Int. Cl. B65g *53/40*

U.S. Cl. 302—40 **5 Claims**



A method and apparatus for conveying particulate material from a silo to a container in which material is transferred to a surge container that is substantially at atmospheric pressure, pressurized fluid is then directed into the surge container to entrain the particulate material and convey it along the path, the path having a trap to assure that the particulate material is conveyed by the fluid.

3,578,815

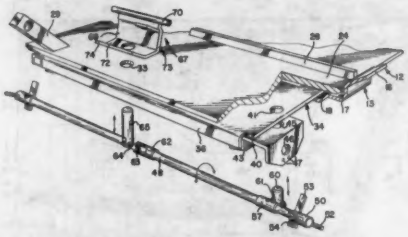
MATERIAL DISCHARGE ARRANGEMENT FOR HOPPER STRUCTURES

William D. Mundinger, Highland, Ernest J. Nagy, Munster, Ind., assignor to Pullman, Incorporated, Chicago, Ill.

Filed Sept. 30, 1968, Ser. No. 763,745

Int. Cl. B65g *53/40*

U.S. Cl. 302—52 **14 Claims**



A discharge arrangement for hopper structures including a sliding gravity gate which is movable to open and closed positions relative to the hopper structure with the gate being movable by a manually operable mechanism. A pneumatic discharge pan is positioned beneath the gate and may be selectively interconnected by an indexing arrangement with the gate to move therewith to the open and closed positions. The manually selectable indexing arrangement by movement of a single rotating shaft is adapted to connect the discharge pan to the gate for movement therewith, to lock the pan in position underneath the discharge opening of a hopper with the gate moved to an out-of-the-way position, and to lock both the gate and the discharge pan in a closed position.

3,578,816

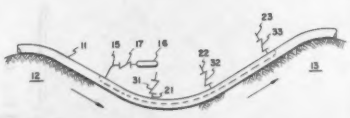
METHOD OF FACILITATING THE RESUSPENSION OF THE SOLID PHASE OF A SLURRY IN A SHUTDOWN PIPELINE

Junn-Ling Chao, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.

Filed Feb. 26, 1969, Ser. No. 802,615

Int. Cl. B65g *53/04*

U.S. Cl. 302—66 **3 Claims**



Method for facilitating the resuspension of settled solids in a shutdown slurry pipeline. As flow in the pipeline is terminated a bladder or bag in the line is inflated in those locations where plug formation by slumping slurry solids is likely to occur. In this manner the settling solids will only occupy the space in the line not occupied by the bladder. Upon restart, the bladder is deflated to allow lateral movement of the solids in the line, thereby facilitating resuspension thereof.

3,578,817

CONTROL OF MINE HOIST BRAKING

Peter De Hertel Eastcott, Peterborough, Ontario, Canada, assignor to Canadian General Electric Company Limited, Toronto, Ontario, Canada

Filed Sept. 19, 1969, Ser. No. 859,272

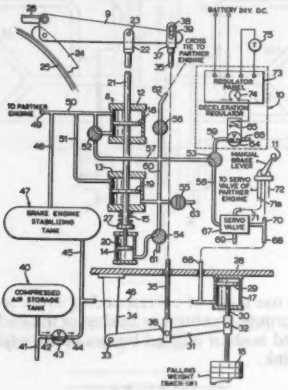
Claims priority, application Canada, Oct. 26, 1968, 33617

Int. Cl. B60t *7/12*

U.S. Cl. 303—16 **4 Claims**

The safety controller for a mine hoist usually incorporates some means for giving a warning of an impending emergency stop when the speed of the hoist exceeds the speed called for by the operating program. Instead of an abrupt emergency

stop, this invention enables the hoist to make an emergency stop at a controlled rate of slowdown giving about the same smoothness as obtained during normal operation. According to the invention, a brake deceleration regulator, which exercises no control over the hoist while it obeys the program, is placed in control of braking by the warning means on the safety controller when the speed of the hoist exceeds the speed called for by the program by the amount necessary to



activate the warning means. The deceleration regulator then brings the hoist to a smooth stop at a fully controlled rate. Since the warning means becomes active at a speed somewhat lower than the speed necessary to bring on a full emergency stop, unregulated emergency stopping will seldom if ever occur. In practice, the deceleration regulator introduces another level of safety into the braking system, a level which produces a smooth stop and reserves the emergency stop for the most extreme conditions conceivable.

3,578,818

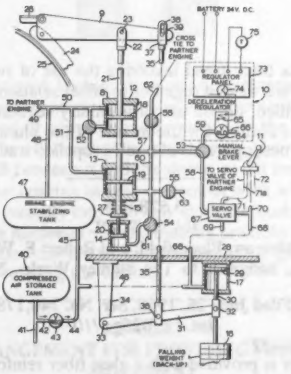
PNEUMATIC ENGINE FOR MINE HOIST BRAKING

Peter De Hertel Eastcott, Peterborough, Ontario, Canada, assignor to Canadian General Electric Company Limited, Toronto, Ontario, Canada

Filed Sept. 19, 1969, Ser. No. 859,345

Int. Cl. B60x *7/12*

U.S. Cl. 303—16 **13 Claims**



Instead of using a single large pneumatic actuator for driving the brake shoes against the rotating brake surface, this invention uses a number of smaller pneumatic actuators, controlled individually and collectively by means of a regulator, for driving the shoes against the braking surfaces. The actuators are coupled with the brake shoes and the pneumatic fluid is controlled by the regulator such that one actuator normally applies the brakes for a medium or light braking effort and it is assisted by one or more of the other actuators when the braking effort required is greater than the one can deliver. In some instances, it may be desirable to construct the actuator as a single multistage unit wherein one stage is in command of the braking and is assisted by the others whenever necessary. The braking equipment also includes the well-known falling weight for emergency application of the brakes in the event of loss of the pneumatic fluid; otherwise the weight plays no part in the braking operation.

3,578,819

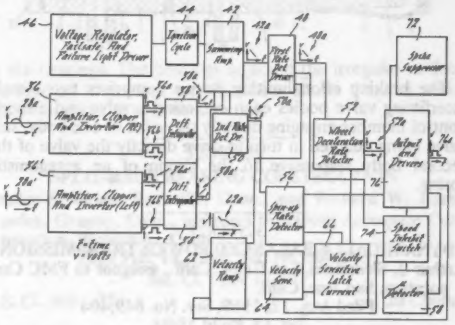
SKID CONTROL SYSTEM

Thomas M. Atkins, Ann Arbor, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Sept. 23, 1968, Ser. No. 761,709

Int. Cl. B60t *8/08*

U.S. Cl. 303—21 **31 Claims**



A skid control system for fluid-actuated brakes of a wheeled vehicle including a modulating valve for modulating the fluid pressure to the fluid-actuated brakes and a control circuit for controlling the valve in response to indications of wheel speed and/or wheel deceleration.

3,578,820

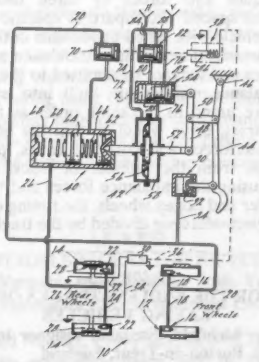
TWO-WHEEL SKID CONTROL BY MODULATION OF BRAKE POWER BOOSTER

Hugh E. Riordan, Ann Arbor, Mich., assignor to Kelsey-Haynes Company, Romulus, Mich.

Filed Aug. 18, 1969, Ser. No. 850,933

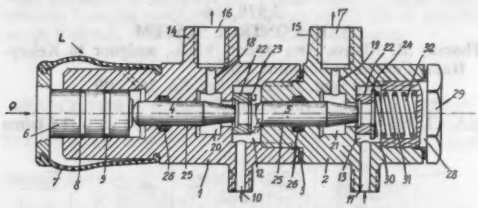
Int. Cl. B60t *8/12, 13/10*

U.S. Cl. 303—21 **8 Claims**



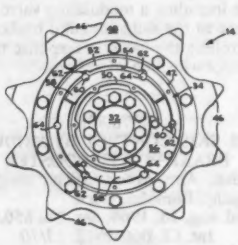
A skid control system for a vehicle having front and rear wheels in which the brakes of the rear wheels are to be skid controlled and with a system utilizing a power booster, this system including means for locking in the pressure to the front brakes upon the occurrence of a skid control signal, at which time the power booster is relieved whereby the pressure to the rear brakes is relieved.

3,578,821
BRAKE LIMITERS
Michel Guettier, Billancourt, France, assignor to Regie Nationale Des Usines Renault, Billancourt (Hauts de Seine), France and Automobiles Peugot, Paris, France
Filed Mar. 14, 1969, Ser. No. 807,369
Claims priority, application France, Mar. 27, 1968, 145,645
Int. Cl. B60t 15/00, 8/18
U.S. Cl. 303—22 1 Claim



The braking effort-limiting device comprises two closely interfitting valve bodies each enclosing a valve and a single control member engaging directly the valve of one body, said valve being adapted in turn to drive directly the valve of the second body responsive to the action of an antagonistic spring.

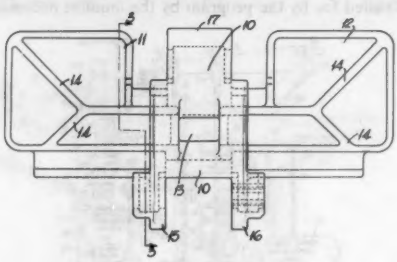
3,578,822
DYNAMICALLY BALANCED POWER TRANSMISSION
Arthur J. Slemmons, Los Gatos, Calif., assignor to FMC Corporation, San Jose, Calif.
Filed Aug. 12, 1969, Ser. No. 849,404
Int. Cl. B62d 55/08
U.S. Cl. 305—24 11 Claims



A rotating power transmission member engaged with a segmented power transmission means is balanced to counteract vibratory torques and forces by three tuned pendulum balance weights spaced 120° apart. A specific application is to a crawler vehicle with tuned pendulums in the track drive, bogey and idler wheel assemblies to balance and counteract vibratory forces and torques transmitted to the wheels by the track. The balance weights are built into each wheel assembly and are tuned to the same order as the number of teeth on the track drive wheel so that the balance weights produce counterforces and countertorques, per revolution, equal to those from the number of track segments, per revolution, causing the imbalance forces and torques. In the case of the idler and bogey wheels, the tuning order is the effective pitch circumference divided by the track pitch.

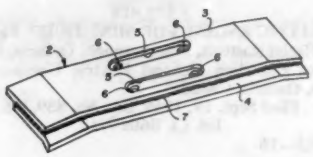
3,578,823
LINKS FOR THE ENDLESS TRACKS OF TRACK-LAYING VEHICLES
Frank Clymer, Lichfield, England, assignor to Lloyds (Burton) Limited, Burton-on-Trent, England
Filed Nov. 21, 1968, Ser. No. 777,754
Claims priority, application Great Britain, Nov. 28, 1967, 54,107/67
Int. Cl. B62d 55/20
U.S. Cl. 305—42 2 Claims

A track link having at each end at least one bush which is formed of elastomeric material and which is located in a recess formed in the link, the exterior of the bush being of noncircular configuration in cross section whilst the interior of the bush is provided with a sleevelike insert which is formed of rigid material, the interior of said insert being of noncircular configuration in cross section and being adapted



to receive in use a pin of corresponding cross section which will extend through the bush or bushes at the end of one link and an aligned bush or aligned bushes at the adjacent end of an adjacent link.

3,578,824
ENDLESS TRACK TREAD
Earl R. Woodward, Jr., Mars, Pa., assignor to Woodward, Inc., Mars, Pa.
Filed Mar. 24, 1969, Ser. No. 809,587
Int. Cl. B62d 55/26
U.S. Cl. 305—54 2 Claims

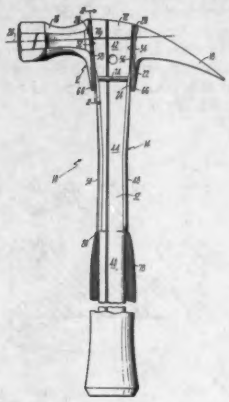


An endless track tread involving the use of two pieces of plate which are welded together in offset relationship at both ends and drilled, or the use of a unitary section of plate of similar offset outline, for use as one of the plurality of overlapping and nesting treads of a self-propelled tractor vehicle.

3,578,825
HAND TOOL
George W. Merrow, Bloomfield, and Robert F. West, Simsbury, Conn., assignors to The Stanley Works, New Britain, Conn.
Filed June 26, 1968, Ser. No. 740,178
Int. Cl. B25g 3/10
U.S. Cl. 306—32 12 Claims

A hammer is provided with a glass fiber reinforced handle having a tenon-shaped end portion in pressuretight engagement with the eye of the hammer head. The handle, which is securely connected to the hammer head without the necessity for separate wedging members or materials, is spaced from the head at the inner end of the eye while being in intimate surface contact therewith along the plane of percussion for a distance of approximately two-thirds the axial length of the eye. The shank and grip portions of the glass fiber reinforced handle are dimensioned to permit mounting of the handle by

passing the shank and handle portions through the eye. Additionally, the handle is self-aligning within the eye by means of



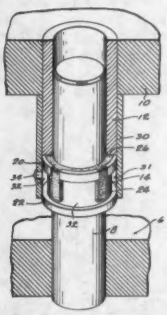
a pair of opposed handle aligning ribs which also serve to confine an auxiliary bonding material.

3,578,826

OILER BUSHING

Kasimir Janiszewski, 5426 W. Andover Road, Milwaukee, Wis.

Filed Sept. 23, 1969, Ser. No. 860,370
Int. Cl. F16c *17/00, 33/10*
U.S. Cl. 308—4 **9 Claims**



A conventional bushing has an oiler extension of very slightly increased interior diameter attached to it by a sleeve having pressed-fit connection externally with the bushing and extension. The oiler section is spool shaped, providing an oil-retaining well between it and the sleeve, and it has a shoulder proximate the bushing to seat an annular wick which has extensions downwardly into the well. Both the bushing and this extension are hardened and the bushing provides an extremely tight fit upon the leader pin, the pin being guided by the extension in entering the bushing.

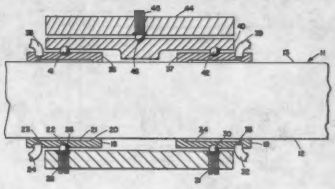
3,578,827

ARRANGEMENT FOR PROVIDING PRECISE MOVEMENT

Joseph E. Smith, Torrance, Calif., assignor to Excellon Industries, Torrance, Calif.

Filed Feb. 19, 1969, Ser. No. 800,488
Int. Cl. F16c *17/00*
U.S. Cl. 308—5 **19 Claims**

This arrangement for providing precision motion includes two relatively movable members, one of which is provided with a surface accurately defining a predetermined path, opposite which is a surface approximately parallel to the first, but not made to the same close tolerances so that some deviations exist. Air bearings are held adjacent these surfaces with ball-and-socket mountings to allow universal movement



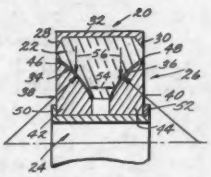
of the bearings. The bearings adjacent the irregular surface are held by a resilient means, which allows them to move when inaccuracies are encountered.

3,578,828

SPLIT-RACE BEARING CONSTRUCTION

Stanley S. Orkin, Rockville, Conn., and Richard W. Hartswick, Granby, Conn., assignors to Kaman Aerospace Corporation, Bloomfield, Conn.

Filed Feb. 18, 1969, Ser. No. 800,143
Int. Cl. F16c *17/10*
U.S. Cl. 308—37 **20 Claims**



A dry, self-lubricating bearing comprises an outer and an inner race with coengaging bearing surfaces with the bearing surfaces on one race being made of a solid lubricant material and the bearing surfaces on the other race being made of a hardened material such as a thin ceramic coating on a metal substrate. In one embodiment, the outer race comprises a single member while the inner race comprises two separate members slidably carried within opposed seats of the outer race with the bearing being capable of absorbing radial, axial and moment loading individually or in combination. In other embodiment, the outer race is split comprising two members and/or the outer race is carried within concave seats of the inner race.

3,578,829

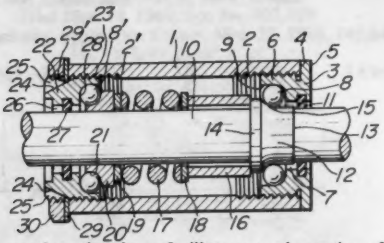
BOTTOM BRACKET FOR BICYCLE

Kotaro Hata, Nara-shi, and Toshikazu Fujii, Yao-shi, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 21, 1969, Ser. No. 878,796
Claims priority, application Japan, Nov. 26, 1968, Apr. 1, 1969, 43/86784; 44/26382
Int. Cl. F16c *3/06*
U.S. Cl. 308—179.5 **7 Claims**

A bottom bracket for bicycle having a pair of ball bearings for supporting a crankshaft, at least one of the bearings having an inner race slidable with respect to the crankshaft, and a coil spring urging the inner race of said one bearing against

the steel balls to avoid chattering of the elements due to localized or irregular wear which would otherwise be produced

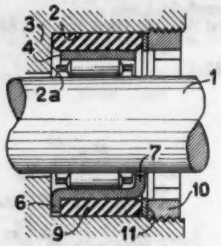


on these members thereby to facilitate smooth rotation of the crankshaft.

3,578,830
NEEDLE BEARINGS

Alfred Pitner, Paris, France, assignor to Rueil Nadella, Malmaison, France, fractional part interest

Filed Aug. 26, 1969, Ser. No. 853,075
Claims priority, application France, Aug. 30, 1968, 164,658
Int. Cl. F16c *35/06*
U.S. Cl. 308—207 **9 Claims**



A needle bearing in which the space for circulation of the needles between the two races is reduced in a plurality of angularly spaced zones around the bearing. To this end the ring forming one of the races is radially deformed in one direction in the region of each of the zones and is supported by an auxiliary resilient member, either the ring or the auxiliary member or both having a variable peripheral profile so that when subjected to axial compression, radial deformation is obtained both of the auxiliary member and the ring in accordance with the peripheral variations to thereby give raised appearance in the zones around the bearing. Furthermore the axial compression of the auxiliary member is adjustable during manufacture to produce a desired radial deformation and this axial compression is subjected into the bearing to maintain this radial deformation permanently during the life of the bearing.

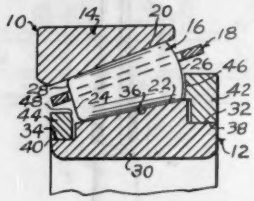
3,578,831
COMPOSITE TAPERED ROLLER BEARING AND METHOD OF MAKING THE SAME

Hudson B. Scheifele, 30165 Ponds View Road, Franklin, Mich. 48025

Division of Ser. No. 685,525, Nov. 24, 1967, abandoned, filed Feb. 13, 1969, Ser. No. 798,931
Int. Cl. F16c *33/34*
U.S. Cl. 308—214 **3 Claims**

This composite tapered roller bearing has outer and inner races, each of which is built up by a method which includes forming annular inner and outer tapered or frustoconical load-bearing roller path members formed from unheat-treated butt-welded strips of steel, subsequently heat-treating and final grinding these annular members, welding to the large end of the annular inner roller path member a finished side ring, forming an annular roller retainer with circumferentially spaced pocket openings, assembling a complement of tapered rollers in these circumferentially spaced pocket openings of this annular roller retainer, these tapered rollers having spherical surfaces on their larger diameter ends, placing the thus-formed assembly on the thus partially built-up inner race, and welding a smaller side ring to the other end of the annular inner roller path member.

These tapered rollers engage a tapered or frustoconical annular inner load-bearing surface on the annular central roller path member of this composite tapered roller bearing inner race, the larger diameter side ring of which has an annular

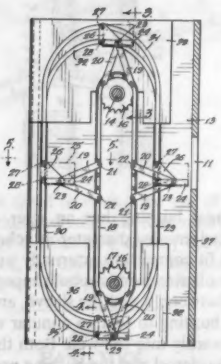


inner surface of spherical curvature mating with the spherically curved surfaces on the larger ends of the tapered rollers. Before welding, the inner roller path member and the side rings are preferably case hardened in the areas actually engaged by the side and end surfaces respectively of the rollers, the remaining area of each ring not so engaged being selectively excluded from the case hardening. This enables the bearing components to be case hardened and precision ground and honed before assembling and welding, preferably by electronic or laser welding to precisely localize the welds.

3,578,832
STABILIZED ELEVATOR FILING DEVICE

Lloyd M. Toms, Crozet, Va., assignor to Acme Visible Records, Inc., Crozet, Va.

Filed Apr. 29, 1969, Ser. No. 820,213
Int. Cl. A47b *47/00*
U.S. Cl. 312—268 **2 Claims**



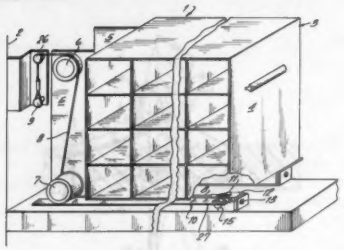
Stabilizer means for a vertically disposed elevator-type filing apparatus comprising a cabinet having a front opening and wherein a plurality of trays disposed therein are adapted to be moved in an elliptical path and presented at said opening for access to said trays on the links of a sprocket chain, comprising closed path elliptical stabilizer means in the form of channel members embracing said sprocket chains and defining spaced vertical components and a pair of double arch components at the top and bottom of said vertical components and merging and communicating with each other and with said vertical components and triangular stabilizers pivoted at one corner to swivel pins carried by support means secured to said trays and carrying rollers at its two remaining corners disposed to slide in and retained by said channel members.

3,578,833

DRAWER SUSPENSION

Philip Frederick, Brooklyn, N.Y., assignor to Supreme Equipment & Systems Corp.

Filed Mar. 14, 1969, Ser. No. 807,291
Int. Cl. A47b 88/00
U.S. Cl. 312—330 6 Claims



A suspension system for a cabinet or the like having at least one drawer comprising upper and lower rollers on each side of the drawer with a cable having both ends affixed to the cabinet (directly or indirectly) threaded in front of the upper roller and in back of the lower roller on each side, each of the cables being under tension, and an adjusting means for each of the cables comprising a block slidable in a direction parallel to the length of the cable, one end of the cable affixed to the block, and a screw means adapted to cause the block to move in its direction of motion and to maintain the block in the position to which it has been moved, whereby the tension on the cable can be adjusted.

A track in the foregoing device mounted immediately beneath the lower roller and extending in the direction of movement of the drawer and so positioned as to be in support relationship with the lower roller when the tension in the cable is insufficient to support the lower roller and the drawer without assistance.

3,578,834

GENERATION OF ALKALI METALS

Paolo Della Porta, and Elio Rabusin, Milan, Italy, assignors to S.A.E.S. Getters S.p.A., Milan, Italy

Continuation-in-part of application Ser. No. 690,125, Dec. 13, 1967. This application Feb. 12, 1969, Ser. No. 798,785
Claims priority, application Italy, Dec. 15, 1966, and Oct. 12, 1967, 31040/66 and 21538A/67
Int. Cl. H01j 9/38, 7/12
U.S. Cl. 316—16 20 Claims

Compositions of matter which release alkali metal vapors comprising an alkali metal compound and a reducing agent for the compound wherein the reducing agent is an alloy of 5 to 30 weight percent aluminum balance zirconium. These compositions are useful in processes for the release of alkali metal vapors used in the production of photosensitive surfaces in vacuum tubes.

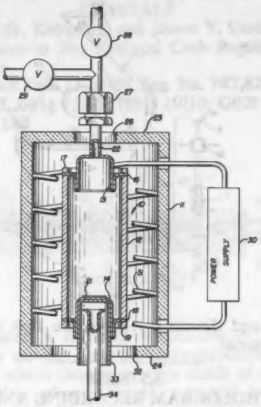
3,578,835

ART OF MAKING VACUUM ENVELOPES

Lowell A. Noble, Hillsborough, and Robert B. Hanley, Campbell, Calif., assignors to Varian Associates

Filed July 28, 1960, Ser. No. 46,026
Int. Cl. H01j 7/18
U.S. Cl. 316—25 7 Claims

1. A bakeout process for a vacuumtight tube containing materials which liberate gases at a given bakeout temperature and a metal which sorbs gases at said bakeout temperature, said process comprising the stops of heating said tube to said bakeout temperature to remove occluded gases, evacuating said tube during said bakeout step, cooling said gas sorbing metal during said bakeout step to maintain the gas sorbing metal at a temperature at which it is substantially ineffective to sorb gases, heating said gas sorbing metal after



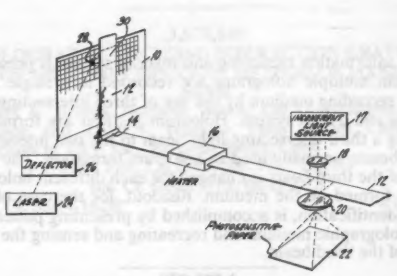
said bakeout step, introducing a hydrogen isotope into said tube, and cooling said tube.

3,578,836

RETRIEVAL OF HOLOGRAPHICALLY RECORDED DATA

William J. Hannan, Pennington, N.J., assignor to RCA Corporation

Filed Oct. 16, 1968, Ser. No. 767,991
Int. Cl. G03b 27/10, 27/32
U.S. Cl. 350—3.5 3 Claims



A two-step process for retrieving holographically recorded pages of information. In the first step, a low power laser is employed to reconstruct the image stored in a small hologram and to record this image in a small area of recording medium. In the second step, a high power incoherent light source and optical means are employed to derive from the small image an enlarged hard copy.

3,578,837

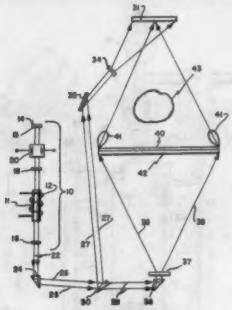
DOUBLE-DIFFUSER HOLOGRAPHIC SYSTEM

Robert E. Brooks, Redondo Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Apr. 1, 1969, Ser. No. 811,805
Int. Cl. G02b 27/00
U.S. Cl. 350—3.5 6 Claims

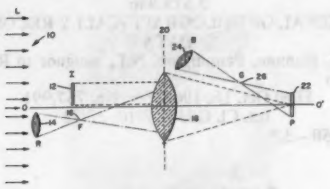
A holographic system for recording holograms of an object in transmission. In order to make more uniform the spatial coherence and the intensity of the light beam of a laser, a light diffuser is disposed in the path of the scene beam. In addition a second light diffuser is also disposed in the path of the diffused and enlarged scene beam. Preferably the second diffuser has a certain directivity which may be achieved by coating the diffusing surface with a transparent lacquer. In order to further improve the directivity of the second diffuser there may be provided a Fresnel lens having one of its focal points in the first diffuser and the other focal point in the recording material for the hologram. The second diffuser

may be replaced by a diffusing and reflecting ellipsoidal section which serves simultaneously the purpose of diffusing the



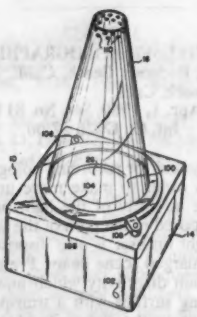
scene beam and directing it from the first diffuser to the recording material.

3,578,838
MULTIPLE HOLOGRAM RECORDING AND READ OUT SYSTEM
James N. Hallock, Watertown, Mass.
Filed Aug. 28, 1969, Ser. No. 853,856
Int. Cl. G02b *27/22*
U.S. Cl. 350—3.5 **4 Claims**



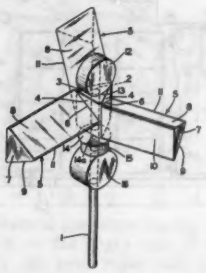
An information recording and readout system is presented wherein multiple holograms are recorded in a single hologram recording medium by the use of three intersecting light beams and a lens system. Hologram patterns are formed by adding a third intersecting light beam to the two intersecting light beams normally used in hologram formation. The location of the third beam is changed for each different hologram to be formed on the medium. Readout, for the case of pattern identification, is accomplished by presenting patterns to the holographic medium and recreating and sensing the position of the third beam.

3,578,839
AUTOMATED DEVICE FOR PROTECTING LENS SYSTEMS
Grant C. Riggle, Bethesda, and James P. White, Bradbury, Md.
Filed Oct. 24, 1968, Ser. No. 770,344
Int. Cl. G02b
U.S. Cl. 350—61 **8 Claims**



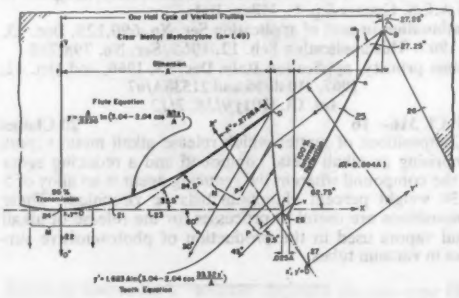
The automated device for protecting lens systems in lasers includes a motor driven protective film which advances across the laser lens after each light flash. A mechanical sensor operative in response to film position selectively connects the film driving motor to an electro-optical control system which energizes the motor in response to light flashes.

3,578,840
REVOLVING REFLECTOR
John O. Richards, 5715 Stumph Road, Parma, Ohio
Filed Jan. 26, 1970, Ser. No. 5,507
Int. Cl. G02b *5/12*
U.S. Cl. 350—99 **4 Claims**



A revolving reflector having three prismatic-shaped blades attached to a bushing through which a central shaft is inserted. The device, due to the position and shape of the prismatic blades, will rotate regardless of the wind direction or its position on a moving object. The various blade surfaces are coated with different reflecting and nonreflecting materials and provide a flashing effect by reflecting light when revolving. The device can be utilized in various ways, as a safety device, on a child's bicycle, or as an indicating marker for a driveway, etc. The revolving reflector is of simple design and can be produced inexpensively, yet is sturdy and durable.

3,578,841
REAR PROJECTION SCREEN
William B. Elmer, 113 Pinckney St., Thornton, N.H. 02114
Filed Dec. 15, 1967, Ser. No. 690,970
Int. Cl. G03b *21/60*
U.S. Cl. 350—127 **11 Claims**



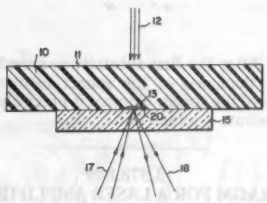
A rear projection screen has a rear surface that provides lens action for collimating incident light rays on essentially the entire screen surface into parallel rays directed essentially perpendicular to the front surface. The front surface is formed with a number of generally parallel closely spaced ribs that diverge incident light rays over a prescribed viewing angle so that anyone within the prescribed viewing angle sees the image projected on the screen with essentially equal brightness. For wide viewing angles the ribs are preferably arranged in clusters so that respective ribs in a cluster direct light rays to respective angular sectors of the viewing region.

3,578,842

EXPLODING MIRROR FOR OPTICAL VIEWING SYSTEM

Richard J. Holland; Zoltan G. Sztankay, Washington, D.C., and Timothy J. Kilduff, Greenbelt, Md., assignors to the United States of America as represented by the Secretary of the Army

Filed Oct. 8, 1968, Ser. No. 766,383
Int. Cl. G02b 5/08
U.S. Cl. 350—160 4 Claims



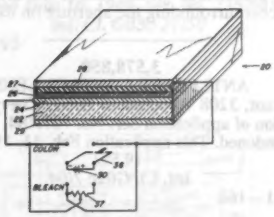
An exploding mirror for an optical viewing system which will partially self-destruct when a laser beam of a minimum predetermined energy density impinges thereon. Using an epoxy encapsulation method, an explosive charge is placed adjacent a thin film mirror on a glass slide. The opposite side of the mirror is part of the optical sight path of the viewing system. A laser beam of sufficient energy density will cause the explosive charge to detonate, thus blowing out a critical section of the mirror and disrupting the optical sight path, thereby protecting the viewer.

3,578,843

CONTROL OF LIGHT REFLECTED FROM A MIRROR

George Augustus Castellion, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Sept. 25, 1968, Ser. No. 773,690
Int. Cl. G02f 1/28
U.S. Cl. 350—160 7 Claims



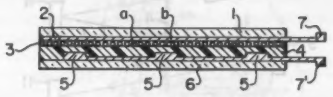
Electro-optical device useful in modulation of reflected light, and the like, typically comprising an electrochromic device and a reflecting layer in sandwiched arrangement, said electrochromic device itself being a sandwich arrangement of a pair of transparent electrodes, and a film of a transition metal compound and an insulating film disposed between the electrodes. The electrochromic device exhibits coloration and bleaching thereof at ambient temperature by control of the polarity of an applied electric field, whereby light reaching the reflecting layer is modulated in intensity, thus modulating, in turn, the reflected light.

3,578,844

RADIATION SENSITIVE DISPLAY DEVICE CONTAINING ENCAPSULATED CHOLESTERIC LIQUID CRYSTALS

Donald Churchill, Kettering, and James V. Cartmell, Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed Feb. 23, 1968, Ser. No. 707,823
Int. Cl. B01g 13/00; H01j 29/10; G02f 1/34
U.S. Cl. 350—160 17 Claims



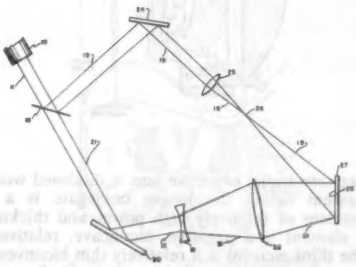
This disclosure is directed to articles of manufacture, chiefly display devices, containing encapsulated cholesteric liquid crystals which change color or shade of color not only upon application of an electric potential but also upon removal of the field. The image produced has a comparable outline to that of the path of the electric field. Three chromatic states are evident, the normal color (before the electric potential is applied), the color given off when the electric field is applied, and the color observed when the electric field is removed. All three chromatic states are readily discernible from one another. The encapsulation of the cholesteric liquid crystal provides an unusual advantage regarding electric field behavior because the third chromatic state (electric potential removed) has a much greater longevity with the encapsulated material versus unencapsulated material of identical composition. Other advantages are also discussed.

3,578,845

HOLOGRAPHIC FOCUSING DIFFRACTION GRATINGS FOR SPECTROSCOPES AND METHOD OF MAKING SAME

Robert E. Brooks, Redondo Beach; Lee O. Heflinger, Torrance, and Ralph F. Wuerker, Palos Verdes, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Feb. 12, 1968, Ser. No. 704,884
Int. Cl. G02b 5/18; G01j 3/18
U.S. Cl. 350—162R 4 Claims

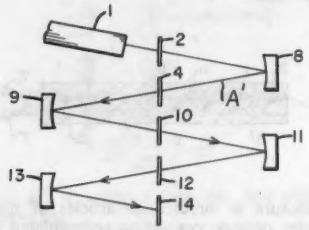


A method making a focusing diffraction grating including casting a diverging beam of coherent light on a photographic plate, casting a convergent beam of coherent light on the same plate so that the beams interfere with each other on the light-sensitive plane of the plate, and then developing the plate. A holographic focusing diffraction grating having a plurality of curved, spaced grating lines on the face of the grating, the lines having specific curves and spacing relating to specific predetermined wavelengths of light for diffracting specific wavelengths of light at predetermined angles. A spectroscope, spectrograph, or spectrometer having a holographic focusing diffraction grating.

3,578,846
MULTIPLE-STAGE OPTICAL INFORMATION PROCESSING SYSTEM

Wu Chen, Royersford, Pa., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 31, 1969, Ser. No. 795,617
Int. Cl. G02b 27/38
U.S. Cl. 350—162 2 Claims

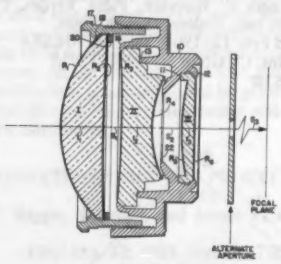


An optical pattern recognition system is disclosed which has multiple reference-pattern capability and materially decreases the space occupied as compared with the prior art. These advantages flow from the use of a zigzag optical path employing concave mirrors in the system and a novel observation plane which allows cascaded multistage operation. An additional advantage is that the mirrors used may be made of metal or other material and force cooled allowing the use of higher intensity sources.

3,578,847
THREE ELEMENT OBJECTIVE LENS

David S. Grey, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of application Ser. No. 687,167, Dec. 1, 1967. This application Oct. 3, 1969, Ser. No. 863,562
Int. Cl. G02b 7/04, 9/16
U.S. Cl. 350—226 1 Claim



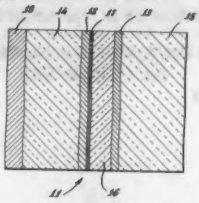
A telephoto triplet objective lens is disclosed wherein the first element facing the longer conjugate is a positive meniscus lens of relatively high power and thickness. The second element is a negative, biconcave, relatively thick, lens. The third element is a relatively thin biconvex positive lens. Lens elements two and three are made from the same material. This lens is designed to be molded from polymer materials.

3,578,848
METHOD OF MAKING AN INTERFERENCE FILTER

Robert R. Austin, Ridgefield, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jan. 26, 1968, Ser. No. 700,928
Int. Cl. G02b/00
U.S. Cl. 350—320 1 Claim

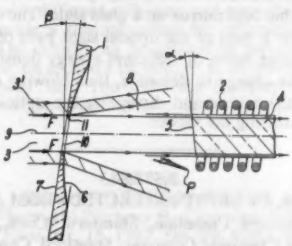
A Fabry-Perot type interference filter in which the two reflectors are identical high reflection coatings and are separated by a spacer element made of solid glass. The coatings are formed on individual substrates which are optically contacted to the ends of the spacer. The coated ends of the substrates are optically contacted to the spacer element in sequence. After the first substrate is joined to the spacer element, the thickness of the spacer element is adjusted. Once the size of the spacer element is precisely that required, the other substrate is joined to it.



3,578,849
DIAPHRAGM FOR A LASER AMPLIFIER CHAIN

Hubert Guillet, Saint Germain-les-Arpajon, France, assignor to Commissariat A L'Energie Atomique, Paris, France

Filed July 10, 1969, Ser. No. 840,813
Claims priority, application France, July 23, 1968, 160311
Int. Cl. G02b 27/00
U.S. Cl. 350—321 1 Claim

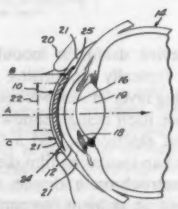


A diaphragm for a laser amplifier chain, comprising an element operable as a transparent divergent lens to an incident laser beam and including an aperture disposed centrally of the lens and of a size to permit a substantially part of a laser beam to pass from a driver laser to a laser amplifier. The element has a planar face on the side of the driver laser and a concave recess surrounding the aperture on its other side.

3,578,850
ANTI-FLARE CONTACT LENS

Alan H. Grant, 3208 Woodhollow Drive, Chevy Chase, Md.

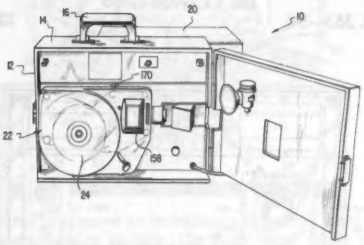
Continuation of application Ser. No. 707,784, Feb. 23, 1968, now abandoned. This application Feb. 11, 1970, Ser. No. 10,592
Int. Cl. G02c 7/04
U.S. Cl. 351—160 2 Claims



Contact lens, together with process and apparatus for making the contact lens, which has an annular surface area of ir-

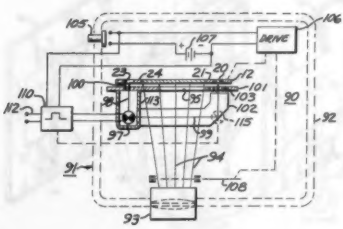
regular or waffled conformation for precluding the transmission of light therethrough.

3,578,851
AUTOMATICALLY THREADED FILM APPARATUS INCORPORATING A PROJECTION APPARATUS AND A PRE-THREADED FILM CARTRIDGE ASSEMBLY
Christian Jensen, Oslo, Norway, assignor to MPO Videotronics, Inc., New York, N.Y.
Filed May 24, 1967, Ser. No. 641,039
Int. Cl. G03b *23/02*
U.S. Cl. 352—72 **10 Claims**



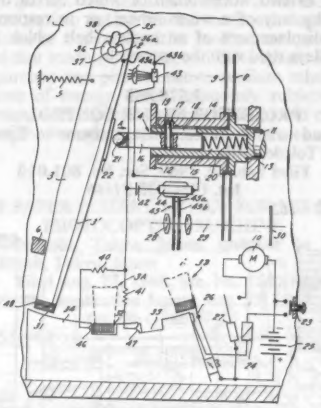
An automatically threaded film apparatus having a projection apparatus and a prethreaded film cartridge assembly intended to be detachably mounted at the projection apparatus. Owing to the synchronous feeding out, running and winding up of the film on the same shaft the film is not exposed to friction, wear and tear. Moreover, mechanism is provided to insure that the film automatically adjusts itself to a desired frame separation between a film gate assembly and a sound head. Simple operation of the unit is insured for by the overall arrangement wherein a common control knob or the like initiates various operations required for reliable visual and/or sound reproduction.

3,578,852
MOTION PICTURE APPARATUS HAVING SENSING MEANS FOR FILM CARRIED CUE SIGNALS
Charles A. Aldridge, Barrington, Ill., assignor to Bell & Howell Company, Chicago, Ill.
Filed June 10, 1968, Ser. No. 735,861
Int. Cl. G03b *21/50*
U.S. Cl. 352—92 **4 Claims**



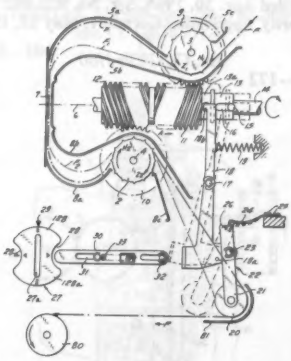
An apparatus for projecting motion picture films has a sensing station located adjacent the path of each margin of the film for sensing control marks on the film. The sensing stations may be selectively actuated to respond to markings on either of the marginal areas or to respond only to the simultaneous occurrence of markings on both marginal areas.

3,578,853
MOTION PICTURE CAMERA
Johann Roth, Schwabhausen; Alfred Roppel, Munich, and Theodor Steibl, Maisach, Germany, assignors to Niezoldi & Kramer GmbH, Munich, Germany
Filed Nov. 26, 1968, Ser. No. 779,051
Int. Cl. G03b *7/14, 21/36*
U.S. Cl. 352—91 **19 Claims**



A motion picture camera with an adjustable rotary shutter and a diaphragm which is adjustable as a function of scene brightness. A lever is pivotable about a fixed axis to adjust the shutter and is movable radially of the axis to adjust the diaphragm independently of scene brightness as a function of the corresponding adjustment of the shutter.

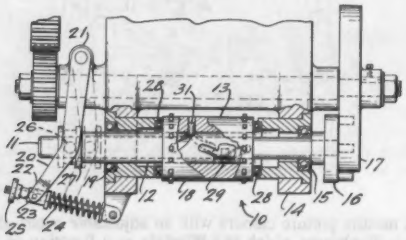
3,578,854
MOTION PICTURE PROJECTOR
Johann Roth, Schwabhausen, Germany, assignor to Niezoldi & Kramer G.m.b.H., Munich, Germany
Filed Oct. 15, 1968, Ser. No. 767,748
Claims priority, application Germany, Oct. 18, 1967, P 15 97 341.8
Int. Cl. B65h *17/42;* **G03b** *1/58*
U.S. Cl. 352—158 **25 Claims**



A motion picture projector wherein the leading end of motion picture film is initially engaged by a first sprocket and thereupon advances along a first fixed loop former, through the film gate and along a second fixed loop former to move into the range of a second sprocket which advances it around

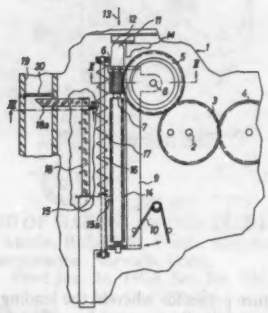
a pivotable deflecting roll and into engagement with the core of a driven takeup reel so that the latter subjects the film to tension. Such tension is utilized to impart to the sprockets additional movements in directions to move the loops of film away from engagement with the loop formers. This is achieved by rotating the first sprocket counter to its normal direction of rotation and by effecting short-lasting additional rotary movement of the second sprocket in its normal direction of rotation. Such movements are superimposed upon normal movements of the sprockets in response to axial movement of two worms each of which drives one of the sprockets by way of a worm wheel, or in response to appropriate displacement of an endless belt which is trained around pulleys rigid with the sprockets.

3,578,855
PROJECTOR FRAME CONTROL
Angelo Boudouris, Sylvania, Ohio, assignor to Eprad Incorporated, Toledo, Ohio
Filed Feb. 20, 1969, Ser. No. 801,010
Int. Cl. G03b *21/46*
U.S. Cl. 352—163 **4 Claims**



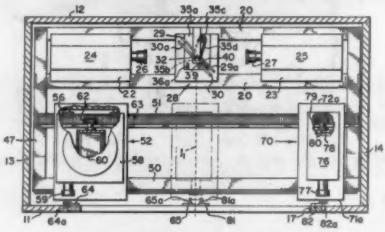
A frame control device for aligning frames on film with a projection lens. A control sleeve is coaxially mounted for limited movement on a driven axle and a film drive sprocket is coaxially mounted on the sleeve for limited movement of the sleeve with respect to the sprocket. Thrust bearings prevent axial movement of the axle and the film sprocket. The sleeve is keyed to the axle and the sprocket such that the phase relationship between the sprocket and the axle may be adjusted by changing the axial position of the sleeve on the axle, thereby aligning the film frame with the lens.

3,578,856
MOTION PICTURE CAMERA WITH FOOTAGE COUNTER
Kurt Thate, Munich; Friedrich Winkler, Unterhaching, and Anton Theer, Munich, Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed Apr. 30, 1969, Ser. No. 820,491
Claims priority, application Germany, May 18, 1968, A 29 797
Int. Cl. G03b *1/60*
U.S. Cl. 352—172 **13 Claims**



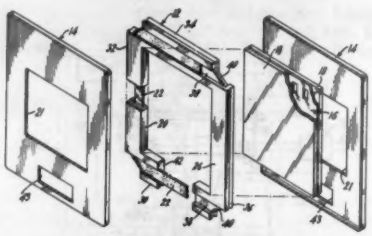
A motion picture camera wherein the film transporting mechanism drives a worm in response to insertion of a film magazine, and the worm moves a pointer with reference to a graduated footage counter scale to indicate the length of exposed and/or unexposed part of the film. The worm is pivoted away from engagement with the pointer in response to removal of the magazine whereby a spring resets the pointer to zero position. The scale transmits light and has an arm which is observable in the view finder. When the pointer moves all the way from starting position, it completely shields the scale from ambient light whereby the operator is informed that the entire film is exposed.

3,578,857
PLURAL UNIT PROJECTION SYSTEM
Edwin Busch, 214 S. Hamilton St., Saginaw, Mich.
Continuation-in-part of application Ser. No. 697,201, Jan. 11, 1968. This application Jan. 27, 1970, Ser. No. 886,420
Int. Cl. G03b *21/26*
U.S. Cl. 353—94 **22 Claims**



A multiple unit projection system for transmitting images to a remote screen wherein a plurality of projectors selectively project an image on the screen along a common image projecting path. At least a pair of the projectors are individually movable from a remote inoperative position to an image projecting position and apparatus is provided for shifting at least one of the movable projectors from the remote inoperative position to an image projecting position and to simultaneously automatically shift at least one of the other movable projectors to its remote position. Mirror means is provided to transmit the image emanating from one of the projectors to the screen along the image projecting path.

3,578,858
SLIDE MOUNT AND TAPE GUIDE
Wesley A. LeMarr, New York, N.Y., assignor to Montage Production Inc., New York, N.Y.
Filed Jan. 31, 1969, Ser. No. 795,487
Int. Cl. G03b *21/64, 31/04*
U.S. Cl. 353—120 **7 Claims**



A combined transparency slide mount and magnetic tape guide having conventional means for mounting a visual transparency and having means for guiding a continuous loop of magnetic tape material through four 90° turns around the edges of said mount. The mount is for use in a slide projector which has both projection equipment and a magnetic tape head and tape drive means so that a transparency can be pro-

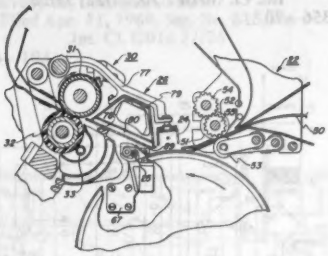
jected and correlated audio information can be played at the same time.

3,578,859

MECHANICAL STRIPPING APPARATUS

William K. Stillings, Penfield, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed July 3, 1969, Ser. No. 838,902
Int. Cl. G03g *15/08*
U.S. Cl. 355—3 13 Claims



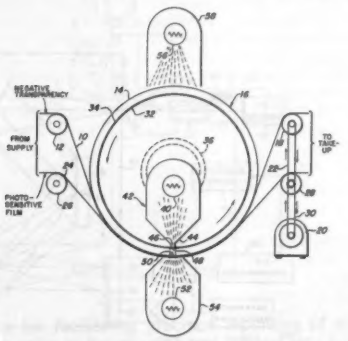
Apparatus to remove an insulating copy sheet from a moving photoconductive surface, the copy sheet being electrostatically tacked to the surface prior to removal by a corona discharge device during a xerographic image transfer operation. A stripping finger is arranged to lift the leading edge of a sheet being advanced on the photoconductive surface and to direct the sheet upwardly away from the surface. A stationary transport having a smooth flat platen to receive a stripped copy sheet in sliding relation therewith is positioned to intercept the leading edge of the stripped sheet and direct the sheet towards a subsequent processing station. Suction ports in the platen located behind the point of contact of the leading edge of the sheet lift the body of the sheet from the stripper finger and hold the sheet in sliding contact with the platen. Lifting means raise the stripper finger away from the moving surface and further stripping of the sheet is accomplished as the sheet slides along the platen and is lifted from the drum surface.

3,578,860

APPARATUS FOR CONTINUOUS DODGING PRINTING

Jacob Louis Breitbord, Framingham, and Richard Donald MacDougall, Arlington, Mass., assignors to Itek Corporation, Lexington, Mass.

Filed Mar. 4, 1968, Ser. No. 710,296
Int. Cl. G03b *27/76*
U.S. Cl. 355—80 25 Claims



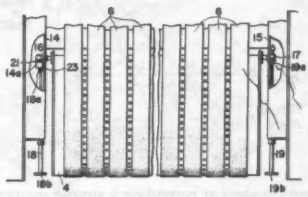
Apparatus is disclosed for continuously dodging a series of photographic reproductions as they are being printed, including an ultraviolet light source for producing a narrow zone of ultraviolet energy to excite a fluorescent surface on the internal wall of a transparent cylinder to emit actinic light, drive means for rotating the cylinder relative to the narrow zone of ultraviolet energy to sweep that zone, which extends transverse to the direction of rotation of the cylinder, along the fluorescent surface to successively excite narrow portions of that surface, and a near infrared light source fixed relative to the ultraviolet light source for directing near infrared light through a transparency onto excited narrow portions of the surface to quench the surface to form a luminous image, unquenched actinic light from the surface being simultaneously directed to a photosensitive medium to expose narrow sections of that medium, and second drive means for moving the transparency and photosensitive medium relative to the narrow zone of energy, for continuously subjecting unexposed sections of the photosensitive medium and companion segments of the transparency to such exposure.

3,578,861

COPY PAPER FEEDING DEVICE FOR USE WITH PHOTOCOPYING MACHINE

Yugoro Kobayashi, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Aug. 27, 1968, Ser. No. 755,564
Claims priority, application Japan, Aug. 31, 1967, 42/74669
Int. Cl. G03b *27/20*
U.S. Cl. 355—91 3 Claims



A photocopying machine having an adjustment mechanism for correcting misalignment of the original. Lateral misalignment of the original is corrected by axial movement of a driving belt unit. Longitudinal misalignment of the original is corrected by pivoting movement of the driving belt unit.

3,578,862

PHOTOGRAPHIC EXPOSING APPARATUS

Edward P. Hudock, Santurce, P.R.; Irving G. Russell, and Robert L. Sorensen, Westport, Conn., assignors to Time, Incorporated, New York, N.Y.

Filed Oct. 7, 1968, Ser. No. 765,300
Int. Cl. G03b *27/22*
U.S. Cl. 355—104 19 Claims

A photographic exposing apparatus which includes a housing, a light source within the housing and a drum carrying a

light-sensitive plate and photographic film past the light source to expose the plate through the film.

The plate and film are both registered to the drum and held by suction to the drum while provision is also made for locking the plate to the drum.

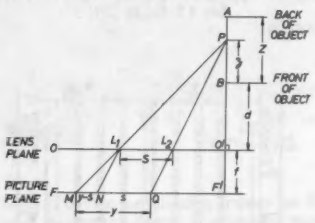
The housing contains air deflecting means for directing a flow of cooling air to the region between the light source and the drum and then for exhausting the air to remove any gases or dust from the housing.

A masking shield is provided between the drum and the light source, and it cooperates with the air deflector means to define air flow passages for directing the cooling air to the region between the drum and the light source.

3,578,863
COMPARATOR DEVICE USING PARALLAX OF TWO PHOTOGRAPHS

Richard George Farrand, 5 Ashbourne Grove, London, England

Filed July 12, 1967, Ser. No. 652,589
Claims priority, application Great Britain, July 15, 1966, 31862/66
Int. Cl. G01c *11/12*; **G01n** *21/00*; **G01h** *11/00*
U.S. Cl. 356—2 **2 Claims**

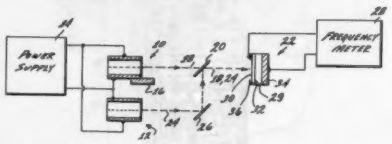


This invention aims at providing a simple means for finding a location in space and for determining the three dimensional coordinates of any object which is shown on a photograph or a pair of photographs. To do this I superimpose one photograph of the object over another photograph of the same object which shows a parallax difference with respect to the first photograph and I then compare the differences in the separations of the vertical centerlines of the photographs with one of the photographs displaced horizontally relatively to the other to superimpose successively a series of pairs of images of the identical points. I also provide an apparatus for making the comparison including a viewing box with a screen and some means of fixing the photograph in relation to the screen and a carriage to move another photograph horizontally across the screen relatively to the first photograph.

3,578,864
SEMICONDUCTOR STRESS TRANSDUCER

Bernd Ross, Arcadia, Calif., assignor to Bell & Howell Company

Filed Sept. 16, 1968, Ser. No. 759,916
Int. Cl. H01s *3/00*; **G01b** *9/02*; **G02b** *27/00*
U.S. Cl. 356—32 **7 Claims**

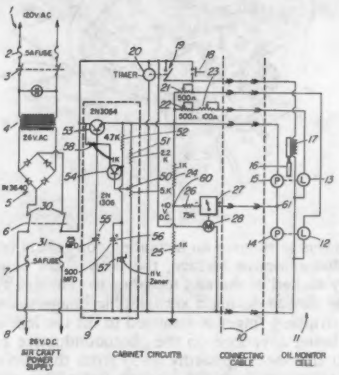


A semiconductor stress transducer in which a coherent light beam from a semiconductor diode laser is photomixed with the light beam from a control semiconductor diode laser. Means are provided for detecting a difference in frequencies of the light beams. The detecting means senses optical heterodyning or homodyning of the photomixed beams and indicates the magnitude of the frequency differential as a measure of stress applied to the transducer.

3,578,865
METHOD AND APPARATUS FOR PHOTOELECTRICALLY MONITORING THE DEGRADATION OF AN OIL STREAM

Alfred E. Traver, Great Neck, N.Y., assignor to Mobil Oil Corporation

Filed Oct. 3, 1968, Ser. No. 764,706
Int. Cl. G01n *1/10, 21/22, 33/28*
U.S. Cl. 356—70 **2 Claims**

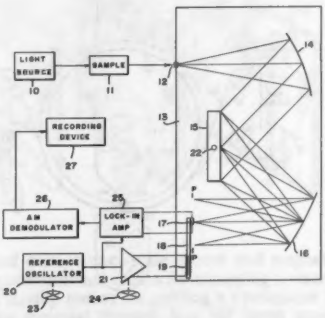


A device for monitoring the degradation of an engine oil stream. The device includes a pair of serially connected photocells which form one side of a bridge circuit. One of the photocells senses the amount of light transmission through a diverted portion of the flowing oil stream. The other of the photocells is located in close proximity to the first photocell to compensate for changes in ambient temperature. The amount of light transmission through the diverted portion of the oil stream is indicative of the degradation of the oil and is reflected by unbalancing the bridge circuit. The amount of unbalance of the bridge circuit is either indicated on a meter or recorded.

3,578,866
FREQUENCY MODULATED OPTICAL SPECTROMETER

Bryan E. Kohler, Cambridge, Mass., and Alan S. Dubin, Hockessin, Del., assignors to California Institute of Technology, Pasadena, Calif.

Filed May 9, 1969, Ser. No. 823,361
Int. Cl. G01j *3/00, 3/42*
U.S. Cl. 356—74 **11 Claims**



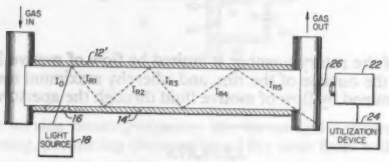
An optical spectrometer is adapted to provide differential wavelength modulation of a spectral signal by vibrating a

photosensitive cell in the focal plane of the spectrograph. A synchronous detector is employed to demodulate the output signal of the photosensitive cell, and thereby provide to a recording device a signal that is the derivative of the spectral signal.

3,578,867
DEVICE FOR MEASURING LIGHT SCATTERING WHEREIN THE MEASURING BEAM IS SUCCESSIVELY REFLECTED BETWEEN A PAIR OF PARALLEL REFLECTORS

Alfred E. Barrington, Lexington, Mass.

Filed Apr. 11, 1969, Ser. No. 815,366
Int. Cl. G01n *21/26*
U.S. Cl. 356—103 **1 Claim**



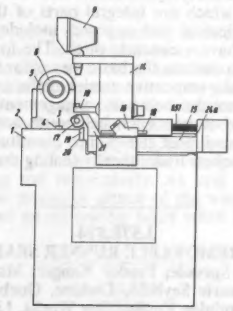
A method and device is disclosed for determining the gas density within a vacuum chamber by measuring the scattered radiation produced when a gas passes through an apparent single coherent beam of light. The beam is directed onto the first of a pair of highly reflective, parallel surfaces and caused to be successively reflected therebetween, the reflecting surfaces being located within the vacuum chamber.

The invention described herein was made by an employee of the United States Government and may be manufactured and used by or for the Government for governmental purposes without the payment of any royalties thereon or therefor.

3,578,868
APPARATUS FOR FACILITATING PRECISION MOUNTING OF TOOLS IN TOOL HOLDERS

Helmut Friedrich Wopkemeier, Dehme, and Werner Richter, Herford, Germany, assignors to Werkzeugmaschinenfabrik Gildemeister & Comp, AKT.-Ges, Bielefeld, Germany

Filed Sept. 12, 1968, Ser. No. 759,387
Claims priority, application Germany, Sept. 15, 1967, P 16 27 041.0
Int. Cl. G01b *9/08;* **B27g** *23/00*
U.S. Cl. 356—165 **10 Claims**

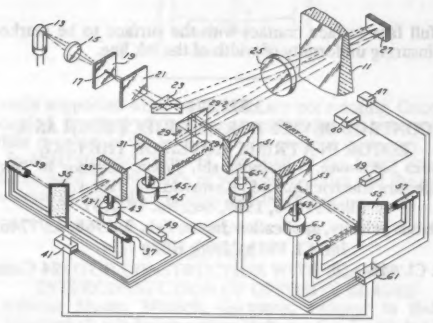


Apparatus for facilitating precision mounting of tools in tool holders prior to insertion of tool holders into spindles, carriages and/or turrets of machine tools comprises a base supporting a rotary spindle for one type of tool holders and having a flat surface adapted to support another type of tool holders. The base is provided with horizontal ways for a first carriage which has ways for a second carriage. The first and second ways are normal to each other and one thereof is parallel to the axis of the spindle and to the plane of the flat surface. Measuring devices are provided on the base and on the two carriages to facilitate movement of carriages to predetermined positions with reference to a holder on the flat surface or with reference to a holder in the spindle. The second carriage is provided with a locating device which enables the operator to install a tool in a predetermined position with reference to a holder in selected positions of the carriages.

3,578,869
METHOD FOR DETECTING AND INDICATING WEDGE IN GLASS

Max J. Irland, Dearborn, and Victor L. Lindberg, Northville, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of application Ser. No. 601,437, Dec. 13, 1966, now abandoned. This application Oct. 10, 1969, Ser. No. 865,338
Int. Cl. G01n *21/32*
U.S. Cl. 356—239 **4 Claims**



A method of measuring wedge in a glass sheet has the following steps. A beam of parallel light rays is projected through the glass sheet. The beam is reflected through the glass sheet and passes through an adjustable correction device. The correction device controls the direction of further projection of the reflected beam depending on the relative position of the device. The reflected beam is split along an axis into at least two separate beams which, in turn, are projected onto separate light-measuring devices. The light-measuring devices produce a signal corresponding to the intensity of the beams projected thereon. The adjustable correction device is repositioned to a position which causes a prescribed relationship to be established in the signals developed by the light-measuring devices. The position of the correction device indicates the direction and degree of wedge in the glass sheet.

3,578,870
INK WRITING INSTRUMENT

Florindo Viti, Palo Alto, Calif., assignor to Uniline Corporation

Filed Mar. 27, 1969, Ser. No. 810,970
Int. Cl. B43k *8/00*
U.S. Cl. 401—199 **8 Claims**

An improved writing tip is provided for an ink pen particularly adapted for creating solid and relatively wide ink lines wherein an elongate porous ink-conducting nib for transferring ink between an ink cartridge and a writing end face of the nib is coaxially surrounded by an elongate hollow open ended housing with the nib writing face protruding from an end thereof. The nib is formed with a reduced cross section closely adjacent the writing face thereof to form a supplemental ink reservoir bounded by the housing and surrounding the porous nib closely adjacent the writing face for rapid

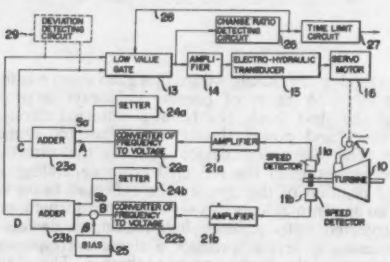
and efficient transfer of the ink thereto and to provide a swivel mounting for the writing end of the nib for maintaining full face-to-face contact with the surface to be marked, and insuring uniformity of width of the ink line.

3,578,871

CONTROL DEVICE FOR AN OBJECT SUCH AS A ROTOR IN A PRIME MOVER OR THE LIKE

Tetsuzo Sakamoto, Yokohama-shi, Japan, assignor to Tokyo Shibaura Electric Co. Ltd., Kawasaki-shi, Japan

Filed Feb. 6, 1969, Ser. No. 797,131
Claims priority, application Japan, Feb. 9, 1968, 43/7746
Int. Cl. F01b *25/00;* H02p *1/54*
U.S. Cl. 415—10 14 Claims



A fail-safe control device for controlling an object such as a rotor of a turbine comprising first and second control systems and a low value gate selecting the output from either of the two control systems which has a safer value. The output of the low value gate is used to control the object, such as the rotor. A change ratio detecting circuit is provided for locking the function of the low value gate when the change ratio of the variable being controlled exceeds a predetermined value.

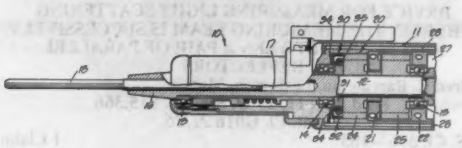
3,578,872

SPEED AND TORQUE CONTROL FOR SURGICAL TURBINE

Thomas W. McBurnie, Santa Barbara, Calif., assignor to Air Instruments, Inc., Santa Barbara, Calif.

Filed Nov. 14, 1969, Ser. No. 876,841
Int. Cl. F01b *25/02*
U.S. Cl. 415—25 5 Claims

A turbine-driven rotary tool has a rotary member mounted to turn within a stationary housing, and a rotary torque plate is mounted within the housing. The torque plate has a flange carrying a peripheral rim, and the flange is provided with a series of apertures. An elastomeric ring encircled by the rim acts to close the apertures when the ring is expanded by centrifugal force into contact with the rim, so that maximum speed of the rotary member is limited by flow of motive fluid around the outside of the rim, and whereby maximum torque is determined by flow of motive fluid through the apertures.

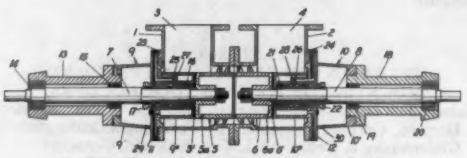


3,578,873

COUNTER-ROTARY PUMPS FOR CHEMICAL LIQUIDS AND PARTICULARLY DYES AND THE LIKE

Guillermo Federico Baez, Jujuy St. 759, Buenos Aires, Argentina

Filed May 26, 1969, Ser. No. 827,789
Claims priority, application Argentina, Nov. 13, 1968, 217,760
Int. Cl. F01d *1/24, 25/18*
U.S. Cl. 415—68 3 Claims



The improvements in counter-rotary pumps for chemical liquids and particularly dyes and the like are characterized in that the blades which are integral parts of their rotors and substantially helicoidal and opposed, include respective flat surfaces which have a constant pitch. The form and placing of these blades constitute the basic means for the reversibility of the pump. Their respective carrier shafts are supported by individual bellmouths being in engagement with a block which, inserted between each bellmouth and each integral portion of the casing of the pump, constitute refrigeration and mounting jackets hydraulically sealing the passage of the said shafts.

3,578,874

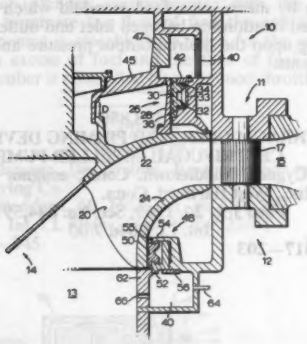
REMOVABLE RUNNER SEAL

Robert Stanley Sproule; Feodor Kanger, Montreal, Quebec, and Hugh Laurie Seybold, Lachine, Quebec, Canada, assignors to Dominion Engineering Works, Limited, Lachine, Quebec, Canada

Filed Aug. 29, 1969, Ser. No. 854,071
Claims priority, application Canada, Sept. 26, 1968, 30,953
Int. Cl. F01d *11/08, 1/20*
U.S. Cl. 415—170 8 Claims

A hydraulic turbomachine such as a pump, pump turbine or Francis turbine having a shrouded runner is provided with sheared seals to minimize leakage through the shroud spaces,

and seal access means, to permit servicing of the seals without removal of the runner from its housing, in the form

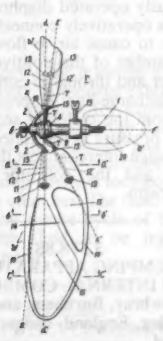


of a service housing adjacent the throat and a crown service housing, permitting disassembly of the seals from within.

3,578,875
ROTARY WING ASSEMBLY

Yoshiyuki Oguri, 9-7, Minami Aoyama 7-chome, Minato-Ku, Tokyo, Japan

Filed Oct. 24, 1968, Ser. No. 770,162
Claims priority, application Japan, July 9, 1968, 43/47525
Int. Cl. B64c *27/74*
U.S. Cl. 416—109 **3 Claims**



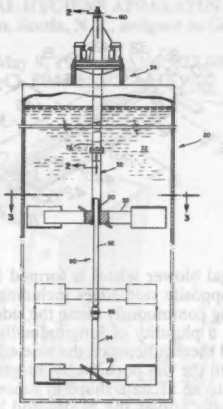
An improved rotary wing assembly is disclosed, in which a tilted bearing body is provided around a principal rotary shaft to which are fixedly secured base end portions of rotary tractive rods, while base portions of rotary following rods are pivotably secured to said tilted bearing body. At the rigid base portion of each wing are drilled two bearing bores extending towards the tip of the wing, and into these respective bearing bores are slidably fitted said rotary tractive rod and rotary following rod respectively. As said principal rotary shaft rotates the angles of attack of the wings are varied to generate lift and an advancing force when the wing moves down.

3,578,876
MIXER

Andrew Stratienko, Philadelphia, Pa., assignor to King of Prussia Research and Development Corporation, King of Prussia, Pa.

Filed June 6, 1969, Ser. No. 831,117
Int. Cl. B01f *7/24*
U.S. Cl. 416—121 **13 Claims**

A mixer is provided with a plurality of impellers which are mounted to hang vertically in a tank. The upper impeller is disposed at a fixed vertical depth and the lower impeller is movable vertically. The shaft of the lower impeller extends through the shaft of the upper impeller and is normally coupled thereto to rotate therewith. The shaft of the lower impeller can be uncoupled from that of the upper impeller and



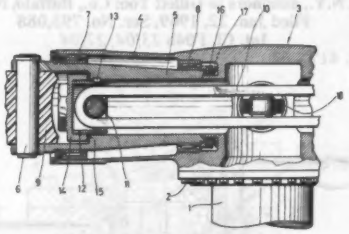
axially supported when both shafts are not rotating. Once uncoupled, the shaft of the upper impeller can again be rotated while the shaft of the lower impeller remains stationary.

In alternate embodiments, the shaft of the lower impeller can be fixed at a plurality of vertical positions and the power function of the upper impeller can be changed.

3,578,877
ROTOR CONSTRUCTION WITH ELASTIC INTERCONNECTION OF OPPOSITE BLADES

Karlheinz Mautz, Munich, Germany, assignor to Bolkow Gesellschaft mit beschrankter Haftung, Ottobrunn bei Munich, Germany

Filed June 4, 1968, Ser. No. 735,956
Claims priority, application Germany, July 11, 1967, B93415
Int. Cl. B64c *27/48*
U.S. Cl. 416—134 **9 Claims**

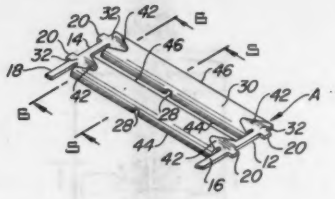


A four blade rotor construction for helicopters includes means for rotatably mounting each blade at equally spaced angular locations around the rotor hub. Diametrically opposed rotor blades are connected with each other by torsion elastic bands or endless members which are stretched across the center of the rotor head with one of the bands being arranged to pass through and intersect the other. The endless bands are formed of laminations of torsion elastic bands and the laminations of one of the bands which connects one pair of blades are arranged in a substantially vertical orientation and the laminations of the other band which interconnects the two adjacent blades are arranged in a substantially horizontal plane. The clearance between the two band loops at the center of the rotor head is such that collective and cyclic pitch controls are possible.

3,578,878
BLOWER WHEEL AND METHOD OF MAKING SAME

Richard V. Ross, Parma Heights, Ohio, assignor to Morrison Products, Inc., Cleveland, Ohio

Filed Aug. 19, 1969, Ser. No. 851,319
Int. Cl. F04d 29/28; B21k 3/04; B23p 15/04
U.S. Cl. 416—178 13 Claims

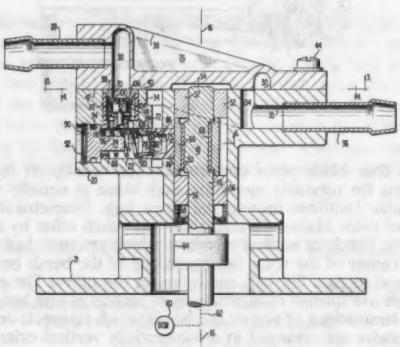


A centrifugal blower wheel is formed from a sheet metal strip having opposite side edges including marginal rim portions extending continuously along the side edges of the strip. The strip has a plurality of longitudinally spaced transverse blades formed therein between the side edges. The blades are connected with the rim portions by integral webs. The blades are formed into an arcuate shape in successive steps. An initial step partially curves the blades and leaves the end portions of the blades adjacent the webs flat. The flat portions are curved in a subsequent step so that the end portions of the blades are work hardened less than if they are successively bent in a plurality of steps. The rim portions are folded between adjacent blades in order to decrease the longitudinal spacing of the blades. The folds are specially formed so that a plurality of bends in each fold are smoothly curved to prevent fracturing of the metal at the bends. The blades have notches formed in their inner edges for receiving the peripheral edges of a pair of discs. The discs have circumferential protuberances adjacent their outer peripheral edges. The protuberances are deformed into contact with one another at their centers to provide each disc with a pair of radially spaced protuberances which are under bending stress and continuously bias the peripheral edges of the discs into firm engagement with the notches.

3,578,879
SPRING ACTUATED FUEL PUMP FOR FUEL INJECTION SYSTEMS

Emile David Long, Elmira, and Kenneth Donald Aumick, Pine City, N.Y., assignors to Gillett Tool Co., Buffalo, N.Y.

Filed Jan. 22, 1969, Ser. No. 793,088
Int. Cl. F04b 23/04, 27/04
U.S. Cl. 417—62 19 Claims

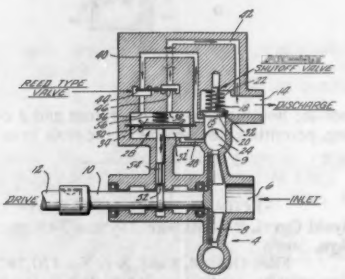


A motor-driven fuel pump for precision fuel-metering systems of the fuel injection type wherein a plurality of radially disposed reciprocating pistons are actuated during the pumping stroke by a pumping spring after the spring has been cocked by means of a motor-driven eccentric motor coupled to the radially disposed pistons. The plurality of pistons can be staged to provide either series or parallel operation by means of a feed manifold which can provide any desired relationship between inlet and outlet connection depending upon the desired output pressure and/or delivery requirements.

3,578,880
DIAPHRAGM OPERATED PRIMING DEVICE FOR CENTRIFUGAL IMPELLER PUMP

John E. Cygnor, Middletown, Conn., assignor to Chandler Evans Inc., West Hartford, Conn.

Filed July 24, 1969, Ser. No. 844,591
Int. Cl. F04d 9/00
U.S. Cl. 417—203 5 Claims

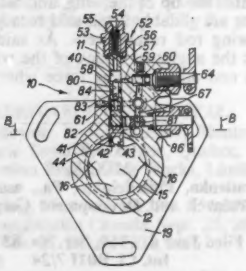


A shaft driven centrifugal impeller pump has a priming arrangement associated with its collector section and drive shaft. A continuously operated diaphragm-type positive displacement pump is operatively connected to a cam mounted on the drive shaft to cause air to flow out of the collector section, into a chamber of the positive displacement pump, out of the chamber and through a conduit connected to the impeller pump's discharge line. A spring loaded shutoff valve prevents a flow from the collector section to the discharge line until the fluid pressure in the collector section forces the valve open. A passage interconnects the chamber of the displacement pump and the collector section to pressure balance the diaphragm.

3,578,881
LIQUID FUEL PUMPING APPARATUS FOR SUPPLYING FUEL TO AN INTERNAL COMBUSTION ENGINE

Dorian Farrar Mowbray, Burnham, and Kenneth Albert Walters Kemp, Ealing, England, assignors to C.A.V. Limited, London, England

Filed Jan. 31, 1969, Ser. No. 796,315
Claims priority, application Great Britain, Feb. 1, 1968, 5138/68
Int. Cl. F04b 23/12, 25/00, 39/10
U.S. Cl. 417—206 6 Claims



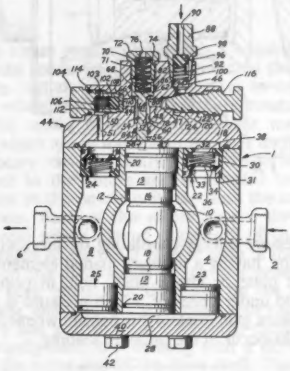
A fuel injection pump having a plurality of pumping plungers mounted in separate bores and actuated by individual

cams the plungers being moved inwardly by the lobes of the cams to discharge fuel from the pumping chambers through valve controlled outlets, each bore having a spill opening which at a predetermined position during the inward movement of each plunger, communicates with the pumping chamber to terminate the flow of fuel through the outlet. Each spill opening is closable by a valve for the purpose of providing an excess of fuel and the flow of fuel into each pumping chamber is controlled by a common throttle valve.

3,578,882
INJECTOR

Leonard F. Janssen, Des Moines, Iowa, assignor to Delavan Manufacturing Co.

Filed Sept. 10, 1968, Ser. No. 758,722
Int. Cl. F04b *25/00, 17/00, 23/06*
U.S. Cl. 417—245 **11 Claims**

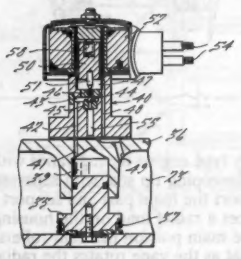


A proportioning injector for injecting a fluid in a positive displacement pump cavity. A passage extends through the injector housing between an inlet for supplying the injection fluid and an outlet for discharging the fluid to the cavity. A chamber is located in the passage and a double-headed piston member having piston surfaces exposed to the chamber and to the pump cavity is located in the chamber to vary the volume of the chamber. The fluid is injected into the pump cavity during the intake cycle of the pump and the chamber is filled with fluid to be injected during the discharge cycle of the pump.

3,578,883
UNLOADER FOR MULTICYLINDER REFRIGERATION COMPRESSORS

Lawrence W. Cheney, Sidney, Ohio, assignor to Copeland Refrigeration Corporation

Filed May 14, 1969, Ser. No. 824,627
Int. Cl. F04b *49/00*
U.S. Cl. 417—286 **3 Claims**

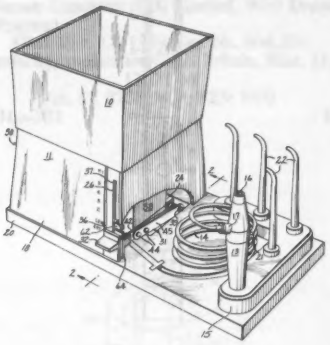


Means are disclosed for controlling the output and reducing the driving load of a multicylinder refrigeration compressor comprising valve means for closing off the inlet to one or more cylinders motivated by the fluid pressure discharge of the compressor and controlled by a solenoid-operated servo valve.

3,578,884
ORAL HYGIENE APPARATUS

Chester F. Jacobson, Scotia, N.Y., assignor to General Electric Company

Filed May 8, 1969, Ser. No. 823,086
Int. Cl. F04d *21/02;* **A61h** *9/00*
U.S. Cl. 417—317 **9 Claims**

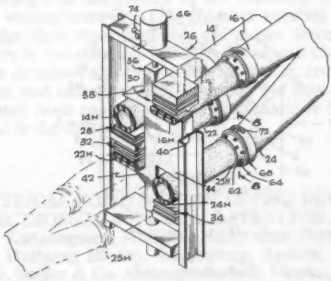


The disclosure herein concerns an improvement for oral hygiene apparatus of the variable pressure pulsed liquid jet type. The oral hygiene apparatus has a single control that regulates the amount of liquid pressure and actuates the motor switch only when the pressure setting is on low, thus permitting the use of a motor that has a lower starting than run torque, such as a shaded pole motor, with a minimum starting torque capacity.

3,578,885
PUMPING APPARATUS

Kelly F. Alton, Malibu, Calif., assignor to James D. Earle, Los Angeles, Calif., fractional part interest

Filed Mar. 5, 1969, Ser. No. 804,512
Int. Cl. F04b *21/00, 43/00, 11/00*
U.S. Cl. 417—454 **7 Claims**



A valve mechanism useful in a pump for pumping concrete comprising a valve member which alternately squeezes closed each of two flexible hoses leading from a hopper which holds concrete to be pumped, and which alternately squeezes closed a pair of flexible hoses leading to two outlets which discharge concrete under pressure. The valve member squeezes the hoses against anvils that are supported on springs, so that a hose is not damaged when a large rock is present therein at the point where the hose is being squeezed.

3,578,886

DOWNHOLE PRODUCING PUMP

Victor J. Nino, Bogota, Colombia, assignor to Texas Petroleum Company, New York, N.Y.

Filed Sept. 11, 1968, Ser. No. 759,177
Int. Cl. F04b 7/00, 34/10, 39/07
U.S. Cl. 417—495 7 Claims

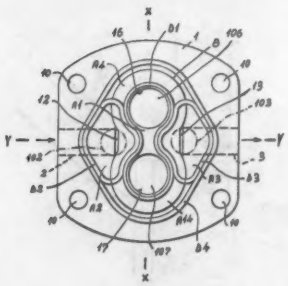
Improved downhole piston pump for production of well fluids involving a multiplicity of quick-acting ports adapted to accelerate handling of heavy or gassy fluids.

3,578,887

GEARED PUMPS

Marco Turolla, 213, Via Toscana, Bologna, Italy

Filed Nov. 12, 1969, Ser. No. 875,710
Claims priority, application Italy, Nov. 15, 1968, 7473A/68
Int. Cl. F04c 5/00; F01c 19/08
U.S. Cl. 418—132 7 Claims



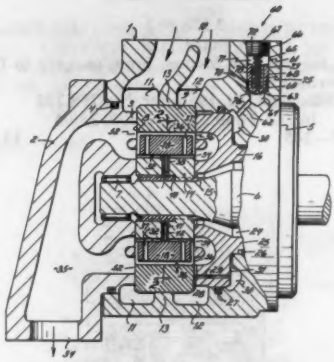
A gear pump has, on the outer face of each bearing plate, four annular symmetrical and symmetrically arranged packings, comprising a central packing which is disposed around the gear wheel pivots and which may be of approximately 8-shaped form, two intermediate packings one on each side of and closely adjacent the central packing, and a peripheral packing encircling both the central packing and the intermediate packing and closely adjacent the latter.

3,578,888

FLUID PUMP HAVING INTERNAL RATE OF PRESSURE GAIN LIMITING DEVICE

Cecil E. Adams, Columbus, Ohio, assignor to Abex Corporation, New York, N.Y.

Filed Apr. 18, 1969, Ser. No. 817,475
Int. Cl. F04c 15/00
U.S. Cl. 418—133 34 Claims



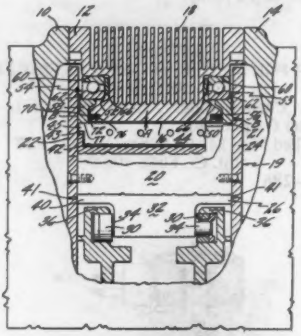
A fluid pressure energy-translating device such as a fluid pump or motor, having a pressure-loaded element, such as a bushing, port plate or cheek plate, held in position in the device by fluid under pressure, which pressure is relieved by a rate of pressure gain control mechanism whenever pressure surges or peaks occur in the pressure loading.

3,578,889

ROTARY ENGINE VANE SEALING MEANS

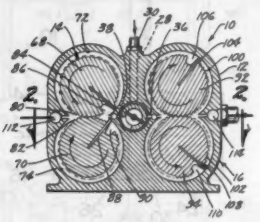
Louis C. Dagne, Juno; Howard J. McLean, North Palm Beach, and George A. Bonner, Palm Beach Gardens, Fla., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Dec. 23, 1969, Ser. No. 887,472
Int. Cl. F01c 19/02
U.S. Cl. 418—147 8 Claims



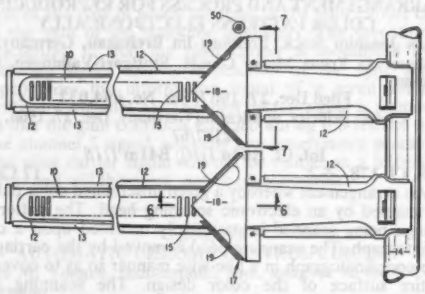
A vaned rotary-type engine having vanes with a main body portion and a telescoping tip seal with separate means being provided to support the main part and support the tip seal so that neither places a radial load on the housing in which the vane rotates. The main portion has cam rollers which ride in cam tracks so that as the vane rotates the radial load is taken through the rollers. The tip seal is supported at each end by two large ball bearing units which are fixed in the housing and have carriers which abut the ends of the tip seal.

3,578,890
ROTARY STEAM ENGINE
Oluf F. Jensen, 929-6th Ave., Council Bluffs, Iowa
Filed Apr. 9, 1970, Ser. No. 26,985
Int. Cl. F01c *11/00*; F04c *11/00*; F04b *49/00*
U.S. Cl. 418—199 3 Claims



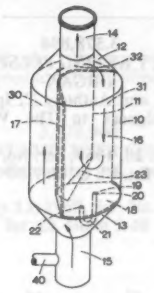
A rotary steam engine comprising a housing including at least first and second power units mounted therein. Each of power units include a pair of cylinders in communication with each other and having two rotors rotatably mounted therein. The rotors have peripheral gear teeth extending therefrom which are in mesh with the gear teeth of the other rotor. A rotary valve is centrally positioned in the housing with respect to the rotors and is adapted to successively supply steam to the power units to cause the rotation of the rotors therein. Each of the rotors have a drive shaft connected thereto which extend outwardly of the housing. A gear is mounted on the outer ends of each of the drive shafts. The gears on the drive shafts of the first power unit are in mesh with each other with the gears on the rotors of the second power unit also being in mesh with each other. The rotary valve has a drive shaft connected thereto which extends outwardly from the housing with a drive gear being secured to the outer end of the drive shaft. The drive gear is in operative engagement with one of the gears of the first power unit and in operative engagement with a gear of the second power unit. Rotation of the rotors causes the rotary valve to be rotated so as to admit and cut off the steam supply to the rotors at the proper times. The rotary valve is provided with a steam discharge opening which has an increasing opening area from one end thereof to the other end thereof to permit the rotary valve to be longitudinally moved with respect to oppositely disposed steam passageways to permit the amount of steam passing therethrough to be varied.

3,578,891
CROSSOVER LIGHTER STRUCTURE FOR GAS BURNERS
Adrian V. Cavestany, Pasadena; Donald R. Smith, Diamond Bar, and Harold R. Bissell, Jr., Hacienda Hts., Calif., assignors to Carrier Corporation, Syracuse, N.Y.
Filed Nov. 28, 1969, Ser. No. 880,602
Int. Cl. F23d *13/02*
U.S. Cl. 431—191 5 Claims



The crossover lighting structure is formed with open-ended gas passages extending along opposite sides thereof. The gas passages communicate at their inner ends with a gas discharge passage in the burner, and they diverge therefrom toward the inlet end of the burner. The outer ends of the passages terminate in close adjacency to the outer ends of the passages of the crossover structures mounted on adjacent burners. The passages decrease in cross-sectional area toward their outer ends. The outer wall structure of each passage if formed with an opening of controlled area extending lengthwise thereof. Preferably, the openings increase in width toward the outer ends of the passages.

3,578,892
GASEOUS SEALING DEVICES
Ronald D. Wilkinson, Pinner, Middlesex, England, assignor to Airoil Burner Company (GB) Limited, West Drayton, Middlesex, England
Filed Mar. 12, 1969, Ser. No. 806,584
Claims priority, application Great Britain, Mar. 21, 1968, 13721/68
Int. Cl. F23b *5/00*; F23c *9/00*
U.S. Cl. 431—202 10 Claims

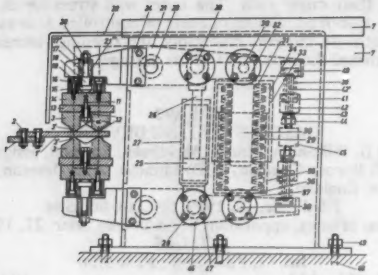


A gaseous sealing device intended particularly for use with flare stacks. The device is composed of two hollow members disposed one within another and a number of walls extending between the members to form first and second chambers communicating with one another, the second chamber communicating with the interior of the innermost member open to the atmosphere. The first chamber receives a waste gas from the flare stack and the gas passes through the first chamber in one direction, through the second chamber in the reverse direction and finally through the innermost member again in said one direction. When the gas flow ceases air is prevented from passing into the first chamber by waste gas trapped in the device.

3,578,893
ELECTRICAL COMPONENT CLAMPING DEVICE IN AN ELECTROMELTING INSTALLATION FOR METALS
Otmar Kleinhagauer; Wolfgang Holzgruber; Peter Cerwenka, and Wolfgang Hladny, Kapfenberg, Austria, assignors to Gebr. Bohler & Co. Aktiengesellschaft, Vienna, Austria
Filed Nov. 18, 1968, Ser. No. 776,401
Claims priority, application Austria, Nov. 20, 1967, Nov. 20, 1967, A10398; A10397
Int. Cl. H05b *7/10*
U.S. Cl. 13—16 4 Claims

A device for establishing an electrical connection with a component to be used, for example, in the continuous casting of metal. The device includes a pair of electrically conductive clamping members which are adapted to clamp the component between themselves. A pair of swing-lever means are respectively swingable about predetermined axes and carry the clamping members. A fluid-pressure means coacts with

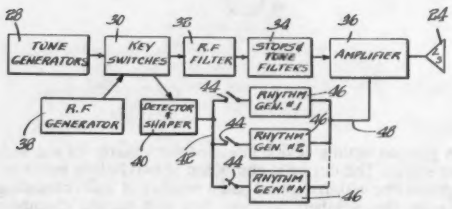
these swing-lever means to act on them in one direction for pressing the clamping members against the component in an opposite direction for retracting the clamping members away from the component.



3,578,894
RADIO FREQUENCY KEYING PULSE IN ELECTRONIC ORGAN

Harold O. Schwartz, and Anthony C. Ippolito, North Tonawanda, N.Y., assignors to The Wurlitzer Company, Chicago, Ill.

Filed Oct. 20, 1969, Ser. No. 867,742
Int. Cl. G10h *1/00*
U.S. Cl. 84—1.01 22 Claims



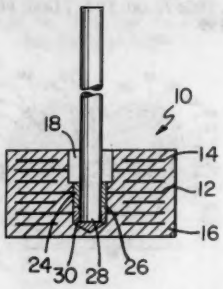
A radio frequency signal is placed on the pickup bus of an audio-keyed electronic organ. The connection is through a resistor and capacitor which form with the input resistors of the audio switches a voltage divider, whereby the level of radio frequency voltage on the bus changes upon closure of any key switch. The radio frequency is amplified and applied to a rectifier to produce a DC potential proportional to the level of the radio frequency, and this is applied through a capacitor to a utilization circuit. Hence as the DC level changes through the capacitor, it appears as a pulse or spike at the utilization circuit, and this pulse or spike is used to key rhythm or other accompaniment effects.

3,578,895
LEAD TERMINAL

Eugene J. Caires, Newtown, Conn., assignor to Vitramon, Incorporated, Monroe, Conn.

Filed June 9, 1969, Ser. No. 831,612
Int. Cl. H02g *15/02*
U.S. Cl. 174—74R 1 Claim

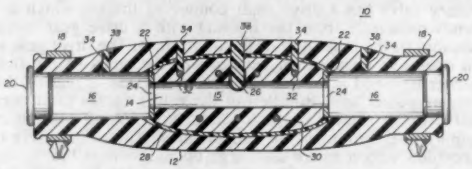
The present invention relates to improved terminals for electrical components having bodies of thermoshrinkable material. More particularly, the present invention relates to a resilient sleeve adapted to be disposed within the body and electrically connected to elements therein and held in position in the body by the shrinking of the body around the sleeve and into holding engagement with the sleeve. The sleeve constituting a socket for receiving and holding a connector or a terminal lead wire.



3,578,896
ELECTRICAL CONNECTOR WITH FUSIBLE PLUG MEANS AND HEATING MATERIAL

Leslie S. Lynch, Martinsville, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Oct. 10, 1969, Ser. No. 865,346
Int. Cl. H02g *15/08*
U.S. Cl. 174—84R 10 Claims



A connector for coupling at least one electrical conductor to a further conductor, or other element, comprising an outer insulating sleeve containing within a longitudinal passage therethrough a fusible plug of material for joining such elements. A heating member may be imbedded within the insulating sleeve about the fusible plug or external to the insulating sleeve and will upon operation cause fusion of the fusible plug. Ports may be provided from the outer surface of the sleeve to the heating member for external operation thereof and for the insertion of temperature sensing probe within the fusible plug. Seals for the various ports are provided to insure the integrity of the outer insulating sleeve.

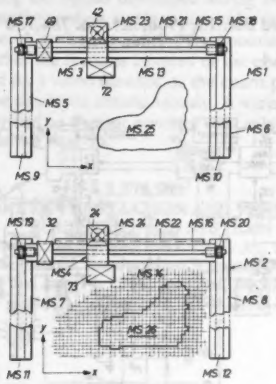
3,578,897
ARRANGEMENT AND PROCESS FOR REPRODUCING COLOR PATTERNS ELECTRONICALLY

Hans Joachim Stock, Freiburg im Breisagau, Germany, assignor to Franz Morat GmbH, Stuttgart-Vaihingen, Germany

Filed Dec. 27, 1967, Ser. No. 694,032
Claims priority, application Germany, Dec. 27, 1966, 72187/67
Int. Cl. H04n *1/10*; B41m *1/18*
U.S. Cl. 178—5.2 17 Claims

An arrangement whereby a given unscreened color pattern is scanned by an electronic scanning head. The pattern or design being scanned is stationarily mounted upon a coordinatograph. The scanning head is moved by the carriage of the coordinatograph in a line-wise manner so as to cover the entire surface of the color design. The scanning head generates electronic signals representative of the colors scanned and transmits them to a signal processing circuit for modifying the signals suitable for transmission to a remote location. A printing head mounted on another coordinatograph

is moved synchronously with the scanning head and receives the signal from the signal processing circuit. The printing

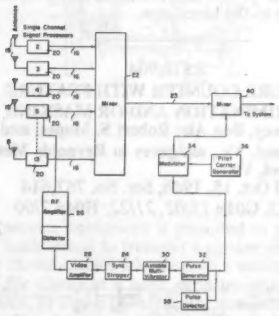


head prints out a color pattern to a desired scale as a reproduction of the design being scanned.

3,578,898
AUTOMATIC GAIN CONTROL FOR MULTICHANNEL TELEVISION SYSTEMS

Irving Kuzminsky, Silver Spring, and Ray B. Kauffman, Seabrook, Md., assignors to Entron, Inc., Silver Spring, Md.

Filed July 1, 1968, Ser. No. 741,497
Int. Cl. H04n *7/08*
U.S. Cl. 178—5.2 **6 Claims**



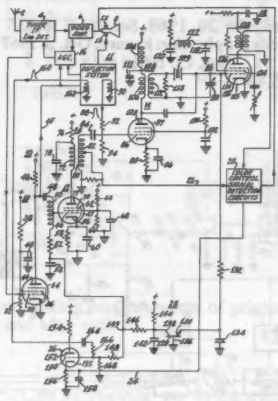
Automatic gain control means for a wide-band multichannel color television system, such as a community antenna TV system of the type in which the level of the pilot carrier controls the gain of the trunkline amplifiers. The invention is characterized in that the pilot carrier is modulated by a modulating signal that is a function of the sync signal stripped from the information signal of a given channel (specifically, channel 5). The pilot carrier signal is so modulated that the gain control is effected during the retrace time of the channel 5 signal, whereby any interference produced by the pilot carrier signal will not be visible on a television receiver and will therefore, not be objectionable.

3,578,899
AUTOMATIC CHROMA CONTROL CIRCUIT

James M. Yongue, Indianapolis, Ind., assignor to RCA Corporation

Filed May 29, 1967, Ser. No. 641,759
Int. Cl. H04n *9/48*
U.S. Cl. 178—5.4 **4 Claims**

A closed loop automatic chroma control circuit for a color television receiver is disclosed in which the grid leak current

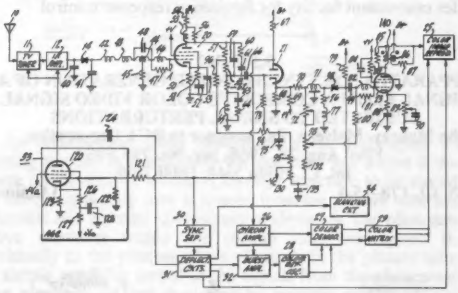


of an injection locked color reference oscillator is supplied to a transistor so as to produce an amplified ACC voltage.

3,578,900
VIDEO AMPLIFIER CIRCUIT

Donald H. Willis, Indianapolis, Ind., assignor to RCA Corporation

Filed May 13, 1968, Ser. No. 728,567
Int. Cl. H04n *9/48*
U.S. Cl. 178—5.4 **6 Claims**



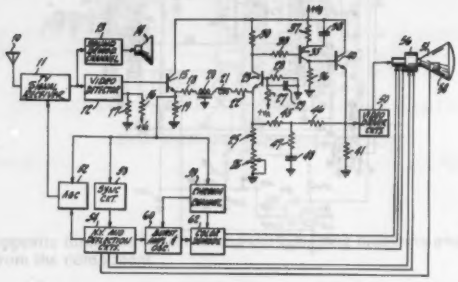
A video signal processing channel for use in a color television receiver employing a positively poled detector, a first amplifying stage coupled to the detector and a second amplifying stage coupled to the first for amplifying composite color television video signals. The output of the first stage is coupled by means of separate alternating current and direct current coupling means to the input of the second stage. The DC coupling path comprises a variable impedance which provides means for compensating for variations in characteristics of devices employed in the first and second stages, for selectively adjusting the DC level of the video signals applied to the second stage and for selecting an operating threshold for an automatic gain control circuit, the input of which is derived from the output of the second stage. The second stage provides input signals to each of the chrominance, AGC and synchronizing circuits of the receiver while furnishing a low impedance source of signals for the luminance delay line.

3,578,901

VIDEO AMPLIFIER FOR DRIVING A DELAY LINE BETWEEN GROUNDED COLLECTOR AND GROUNDED BASE

Dal F. Griepentrog, Indianapolis, Ind., assignor to RCA Corporation

Filed May 20, 1968, Ser. No. 730,335
Claims priority, application France, Oct. 3, 1967, 123101
Int. Cl. H04n 9/18
U.S. Cl. 178—5.4R 11 Claims



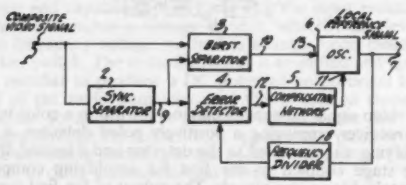
Transistorized luminance channel of a color television receiver includes emitter follower coupled to input of luminance delay line and common base amplifier coupled to delay line output. Low output impedance of emitter follower and low input impedance of common base amplifier permits reliable termination of both ends of delay line with resistors substantially matching characteristic impedance of delay line. Common emitter amplifier serves to amplify and invert output of common base amplifier, and inverted signal is applied to power output stage via common collector stage providing a low impedance output circuit. Negative feedback established by path between emitters of common collector and common base amplifiers ensures low source impedance required to adequately drive output stage; feedback path provides convenient facility for frequency response control.

3,578,902

APPARATUS FOR SYNCHRONIZED GENERATION OF A SIGNAL FROM A COMPOSITE COLOR VIDEO SIGNAL SUBJECTED TO SIGNAL PERTURBATIONS

John Monsay, Malvern, Pa., assignor to RCA Corporation

Filed Aug. 28, 1968, Ser. No. 755,895
Int. Cl. H04n 5/44; H04l 7/00
U.S. Cl. 178—5.4 3 Claims



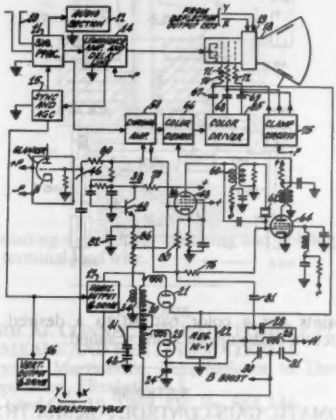
A technique is disclosed for providing a local reference signal in response to a composite color video signal. The frequency and phase of the reference signal are determined by certain signal portions of the composite signal. The nominal frequency of the reference signal is made to conform to a multiple of the horizontal synchronizing signal frequency portion of the composite signal. The reference signal is further influenced by the presence of the color burst signal portion of the composite signal, to synchronize the reference signal in phase and frequency to the burst signal.

3,578,903

CONTROL CIRCUITS FOR PREVENTING KINESCOPE COLOR SATURATION DURING BLOOMING

Donald H. Willis, Indianapolis, Ind., assignor to RCA Corporation

Filed Dec. 18, 1968, Ser. No. 784,730
Int. Cl. H04n 9/48
U.S. Cl. 178—5.4 9 Claims



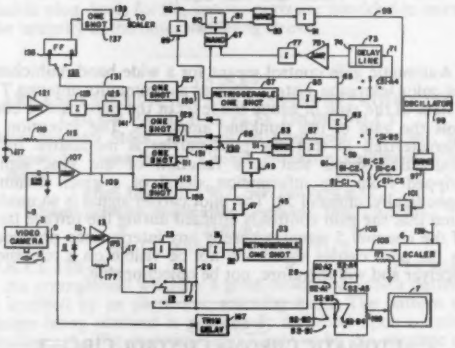
In a color television receiver a condition arises where the load demands on deflection circuitry causes blooming during a color transmission. These increasing load demands are detected in the receiver and the detected signal is used to reduce the gain and therefore the drive supplied by the chroma amplifier to the kinescope. The result is to decrease the load demands on the deflection circuitry by decreasing the chroma drive to the kinescope.

3,578,904

FEATURE COUNTER WITH FEATURE DISCRIMINATION AND/OR MASKING

Raymond D. Dewey, Bon Air; Robert S. Mapes, and Garth S. Jones, Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Oct. 15, 1968, Ser. No. 767,614
Int. Cl. G01n 15/02, 21/22; H04n 7/00
U.S. Cl. 178—6 23 Claims



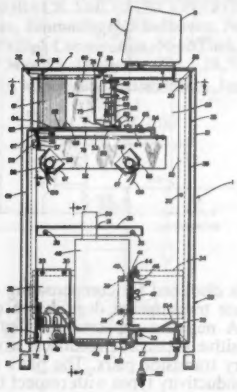
In the disclosed system a specimen is scanned by a video camera and the resulting video signals are applied to a digital logic circuit. The logic circuit is manually settable so that it produces signals only when the video camera scans features

of the specimen that are greater than a preselected width and darker (or lighter) than a preselected grey level. The logic system includes a delay line and an anticoincidence detector for comparing the signals developed during two consecutive line scans so that only a single count pulse is produced for each feature. A scaler is provided for counting the features scanned. Either the features counted or the count pulses may be displayed on a video monitor or the count pulses and features may be displayed simultaneously. A variable electronic mask is provided so that an operator may select any portion of a specimen for analysis.

3,578,905
SIGNATURE AUTHORIZATION AND VERIFICATION EQUIPMENT AND SYSTEM

Walter G. Anders, and Henry W. Kumpf, Jr., Canton, Ohio, assignors to Diebold, Incorporated, Canton, Ohio

Filed Jan. 14, 1969, Ser. No. 790,977
Int. Cl. A47b *81/06;* **H04n** *7/18*
U.S. Cl. 178—6 **23 Claims**



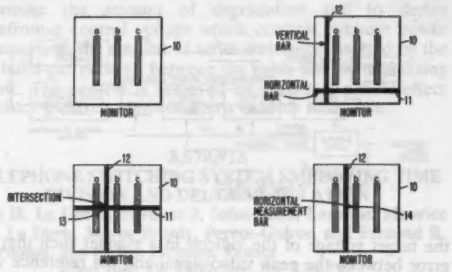
Banking service equipment is provided to permit one of a number of bank tellers to transmit a picture of a signature on a check by closed-circuit television to a monitor for one of a number of file clerks at a bank department where signature cards are filed, so that a file clerk can compare the signatures on the check and card, verify the authenticity of the signature on the check, and actually stamp the check to signify that the signature has been verified and that a banking transaction based on the check is authorized. The stamping is accomplished by an approval stamp located at the teller station actuated by pressing a button at the file clerk station. The equipment also is provided with means for signaling the teller in event that the file clerk determines that the signatures are not believed to be the same. This system enables entire responsibility for authorization to be placed on the file clerk.

3,578,906
CLOSE CIRCUIT TELEVISION MEASUREMENT SYSTEM

Larry W. Holmstrom, Vestal; James A. Tuttle, Endicott, and Harold J. Young, Vestal, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 24, 1969, Ser. No. 879,482
Int. Cl. H04n *7/18*
U.S. Cl. 178—6 **10 Claims**

A system designed to make linear measurements of an optical image in either a vertical direction or a horizontal direction for use in printed circuit manufacture wherein line-

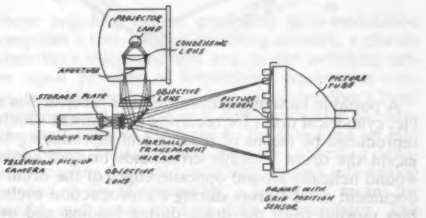


width and line-spacing measurements of printed circuits are made before and after etch.

3,578,907
OPTICAL-ELECTRONIC PICTURE STORAGE APPARATUS

Hans Joachim Stock, Freiburg Im Breisgau, and Gernot Gottschall, Boblingen, Germany, assignors to Franz Morat GmbH, Stuttgart-Vaihingen, Germany

Filed Sept. 13, 1967, Ser. No. 667,397
Claims priority, application Germany, Sept. 13, 1966, M70919/67
Int. Cl. H04n *3/22*
U.S. Cl. 178—6.8 **6 Claims**



An arrangement using optical-electronic techniques for storing a picture. A television picture tube has within it discrete photosensitive elements forming a picture to be stored. A television pickup tube is spaced from the picture tube and contains also discrete photosensitive elements. The photosensitive elements within the pickup tube correspond individually to the photosensitive elements in the picture tube. A simple amplifier amplifies the signals from the photosensitive elements so that they may be suitable processed. The image upon the picture tube is precisely reproduced upon the pickup tube by an image-forming arrangement. A grid pattern is provided on both tubes so that the two grids correspond identically in space and in time so that the image is precisely reproduced.

ERRATA

For Classes 178—6, 6.6, 7.3, 7.85 see:
Patent Nos. 3,579,249 thru 3,579,252

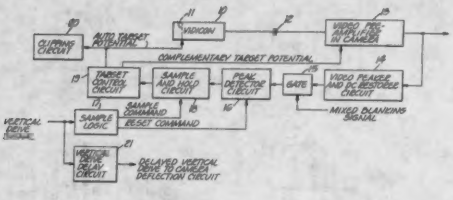
3,578,908
AUTOMATIC PEAK VIDEO CONTROL SYSTEM

William R. Tompkins, Pacific Beach, Calif., assignor to Cohu Electronics, Inc., San Diego, Calif.

Filed Dec. 5, 1968, Ser. No. 781,557
Int. Cl. H04n *5/19*
U.S. Cl. 178—7.2 **14 Claims**

An automatic peak video control system for vidicon tubes in which the peak level of the video signal is detected and

stored during each field scan of the vidicon. The detected signal is sampled, compared with a reference voltage, and applied to the input of an integrating amplifier which controls



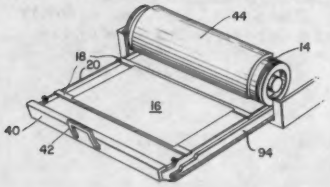
the target voltage of the vidicon in a manner such that the error between the peak video signal and the reference voltage will be reduced toward zero.

3,578,909

PAPER FEED CABLE INDEXING SYSTEM

Eric A. Von Hippel, Weston, Mass., and Charles C. Stimus, Jr., Danbury, Conn., assignors to Graphic Sciences, Inc., Danbury, Conn.

Filed Aug. 19, 1968, Ser. No. 753,542
Int. Cl. H04n *3/04*
U.S. Cl. 178—7.6 **18 Claims**



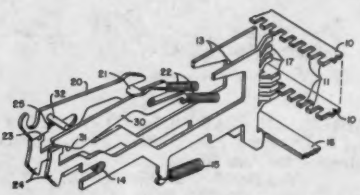
A portable facsimile transmitter and receiver has a rotatable, cylindrical drum for receiving a document which is to be reproduced by means of reading and reproducing heads adjacent the drum. Flexible crossbands bridged across cables wound helically around opposite edges of the drum hold the document on the drum during a reproduction cycle; the cables unwind from the drum during loading and unloading. For ease of loading, the drum is spring wound; a safety stop is provided to prevent premature reverse rotation of the drum during loading or unloading. A margin control enables adjustment of the reproduction cycle to accommodate documents of differing length. An arm extends against the drum when the drum rotation is to be stopped and locks the drum in a reference position at the end of each reproduction cycle to facilitate loading and unloading.

3,578,910

SIGNAL RESPONSIVE FUNCTION PERFORMING MECHANISM

Robert E. Arko, Mount Prospect, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed July 1, 1968, Ser. No. 741,460
Int. Cl. H04l *15/26*
U.S. Cl. 178—23 **10 Claims**



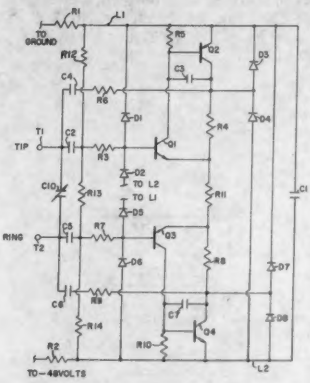
A function mechanism for producing an output upon receipt of any signal except a designated signal comprising a universal function bar responsive to all signals, a universal function pawl responsive to the universal function bar, a coded function bar responsive to the designated signal and means responsive to the coded function bar for preventing the universal function pawl from responding to the universal function bar.

3,578,911

TELEPHONE WIRE PAIR COMPENSATOR UTILIZING NEGATIVE CAPACITANCE CIRCUIT

Warren G. Bender, Wellesley, and Robert C. MacKenzie, Franklin, Mass., assignors to Communication Technology, Inc., Burlington, Mass.

Filed Feb. 12, 1970, Ser. No. 10,849
Int. Cl. H04b *3/18;* **H03h** *11/00*
U.S. Cl. 178—45 **11 Claims**



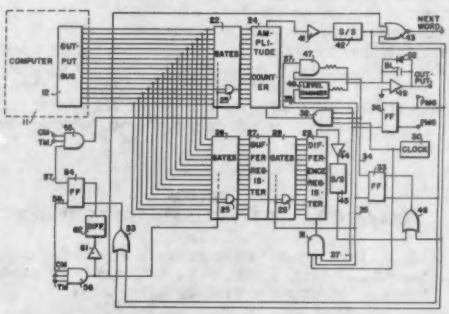
Apparatus is disclosed for compensating a telephone wire pair to alleviate transmission degradation caused by wiring capacitance. A negative capacitance effect is provided by employing positive capacitive feedback around each of two complementary transistor pairs. The pairs are also complementary in conductivity types with respect to each other and are connected effectively in series across a DC potential source so as to operate efficiently and in a balanced manner in a telephone environment.

3,578,912

SOUND GENERATOR

William E. Beavers, Jr., Maryland City, and William H. Sturdevant, Bladensburg, Md., assignors to Singer-General Precision, Inc.

Filed Feb. 23, 1968, Ser. No. 707,615
Int. Cl. G10l *1/00*
U.S. Cl. 179—1 **9 Claims**



This invention comprises a system for digitally generating desired sounds under the control of a digital computer. The

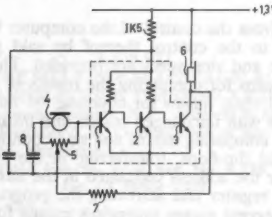
sound generator of this invention can be used to duplicate or synthesize available sounds. To accomplish this, the sound to be duplicated is analyzed to indicate which frequency bands are present in the sound and the relative amplitudes for each band. The actual generation of the sound is by a transducer, such as a loudspeaker, which is fed by the output of a flip-flop. The time duration of a complete cycle of the flip-flop determines the frequency of the signal being generated, and the duty cycle determines the amplitude of that signal. There are many different ways to achieve a duplicate of a known sound. For example, if the sound to be duplicated contains a fundamental frequency and primarily odd harmonics, then the output of the flip-flop, a rectangular wave, can be fed directly to the transducer. Other shaped waves, such as triangular waves, sine waves, etc., can be produced by the use of differentiating circuits, integrating circuits, filters, and the like. In addition, the harmonics can be generated and supplied simultaneously by using duplicate apparatus, or they can be generated in sequence using a single apparatus if they are sufficiently close in time to create the impression of a single, composite sound.

3,578,913

TRANSISTOR AMPLIFIER WITH NEGATIVE FEEDBACK VOLUME CONTROL

Pieter Johan Ufkes, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 13, 1968, Ser. No. 728,701
Claims priority, application Netherlands, June 9, 1967, 6708111
Int. Cl. H03f *3/00*
U.S. Cl. 179—1 **7 Claims**



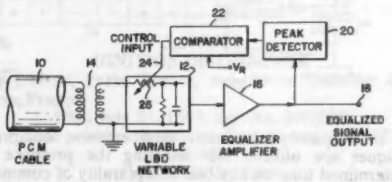
A hearing aid amplifier comprising a capacitor and a microphone in series across the amplifier input terminals and a volume control potentiometer in shunt with the microphone. A resistor connected between the amplifier output terminal and the movable arm of the potentiometer provides, at the input terminals, a DC negative feedback voltage and an AC negative feedback signal that varies with the adjustment of the Pot arm to provide volume control for the hearing aid.

3,578,914

EQUALIZER WITH AUTOMATIC LINE BUILD-OUT

Richard A. Simonelli, San Francisco, Calif., assignor to Lynch Communication Systems, Inc., San Francisco, Calif.

Filed Apr. 9, 1969, Ser. No. 814,680
Int. Cl. H04b *3/14*
U.S. Cl. 179—15 **5 Claims**



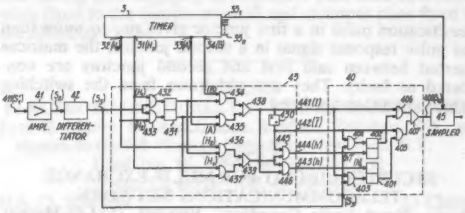
Automatic line build-out is provided in the equalizer stage of a PCM telephone repeater to correctly and continuously match the repeater automatically to any line length and to varying line parameters. To reduce the power requirements to a minimum, the circuit utilizes the equalized signal itself to determine the amount of degradation and to derive therefrom a control voltage which controls, without power consumption, the amount of series resistance inserted by the line build-out network between the cable and the equalizing circuit. The control is achieved by means of a field-effect transistor passively connected as a variable resistance.

3,578,915

TELEPHONE SWITCHING SYSTEM EMPLOYING TIME DIVISION AND DELTA-MODULATION

Yves H. Le Goffic, Pavillon 3, Saint-Roch, Lannion; Maurice F. Le Dorh, 34 rue Branly, Perros-Guirec, and Fernand R. Arnouat, Pen an Ru, Lannion, France

Filed June 19, 1969, Ser. No. 834,798
Claims priority, application France, June 21, 1968, 156,176
Int. Cl. H04m *3/24*
U.S. Cl. 179—15BY **3 Claims**



Telephone switching system employing delta-modulation which comprises a time-division switching network, a plurality of subscriber's telephone sets and, in the switching network, an equal plurality of subscriber's equipments connected to the subscriber's sets by four-wire subscriber's lines. Each subscriber's set comprises a delta-modulator for converting the analog signals produced by the telephone set into delta-coded pulses, a delta demodulator for converting delta-coded pulses coming from said switching network into analog signals applied to the telephone set, a timer and means for synchronizing said timer by said delta demodulator. The switching network comprises a timer defining sampling periods. Each subscriber's equipment comprises means for receiving delta-coded signals from the telephone subscriber's sets, a pulse converter and stretcher converting each delta-coded pulse received from a subscriber's set into a long pulse of the same binary value, having a duration equal to one sampling period and coincident with the full sampling period just following said delta-coded pulse occurrence time, means for sampling said long pulse during the time slots allocated to the subscribers and comprised within said sampling period, and means for transmitting delta-coded signals to said telephone subscriber's sets.

ERRATA

For Classes 179—6.3, 179—17, 179—18, 179—100 see: Patent Nos. 3,579,253 thru 3,579,256

3,578,916

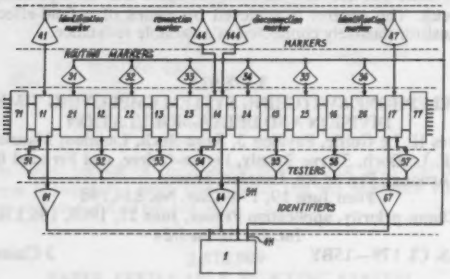
TELEPHONE SWITCHING SYSTEMS

Pierre M. Lucas, 20 rue tariel, Issy-Les-Moulineaux, and Michel M. Rouzier, 15 Chemin de la Sabliere, Vauhallan, France

Filed Apr. 18, 1969, Ser. No. 817,403
Claims priority, application France, Apr. 19, 1968, 148,810
Int. Cl. H04q *3/42*
U.S. Cl. 179—18GE **2 Claims**

Device for detecting in a switching system including crosspoint matrices, those of said matrices which have faulty crosspoints. The switching system comprises crosspoint matrices interlaced with junctor stages whose junctors are in-

serted in the subscriber's lines connected to the outer matrices and in the intermatrix junction lines. The junctor stages are associated with identification markers capable of applying a pulse to a selected junctor and with identifiers capable of detecting said pulse response signal. When an



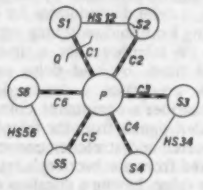
identification pulse in a first junctor gives rise to more than one pulse response signal in a second junctor, the matrices inserted between said first and second junctors are considered as faulty. They are withdrawn from the switching system when they are freed.

3,578,917

SECURITY CIRCUIT FOR MULTI-EXCHANGE TELECOMMUNICATIONS NETWORK

Charles Henri Emile Grandjean, Villejuif, (Val-de-Marne), and Jean Perrault, Port-Marly, (Yvelines), France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed June 16, 1969, Ser. No. 833,579
Claims priority, application France, June 18, 1968, 155361
Int. Cl. H04q *3/56*
U.S. Cl. 179—18 **5 Claims**



In a telephone exchange comprising a central processor serving several satellite exchanges, a satellite is completely blocked when the cable which connects it to the processor is out of order. According to the invention, each pair of satellites is interconnected by means of a single communication channel so that the transfer of data between the processor and the satellite whose cable is out of order may be effected via another satellite.

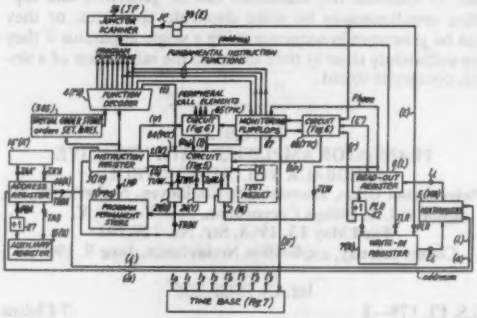
3,578,918

COMPUTER CONTROLLED SWITCHING SYSTEM USING FLIP-FLOPS FOR CONTROL OF REPETITIVE OPERATIONS

Pierre M. Lucas, 20 rue Tariel, Issy-Les-Moulineaux; Jean F. Duquesne, 120 rue de Javel; Jean-pierre L. Berger, 124 boulevard Auguste Blanqui, Paris, and Roger L. Courtois, 65 avenue Paul Vailant-Couturier, Gentilly, France

Filed Aug. 6, 1969, Ser. No. 848,063
Claims priority, application France, Aug. 8, 1968, 162,411
Int. Cl. H04q *3/54*
U.S. Cl. 179—18ES **2 Claims**

Digital computer for controlling telephone switching systems. The computer can be controlled selectively by two control circuits: a program permanent store and a group of flip-flops. The program permanent store has written therein contingent instructions relative to telephone communication establishment and release processing operations and is associated with a readout instruction register, an instruction address register and an auxiliary instruction address register. A multiregister has written therein register words containing data relative to the actual state of a telephone communication being processed, and this multiregister is associated with a readout register and a write-in register. The group of flip-flops controls repetitive operations, such as reading out from the readout register the register words, testing the potentials of points located in said switching system and rewriting in the write-in register the register words selectively modified according to the test results. A first means and a second means



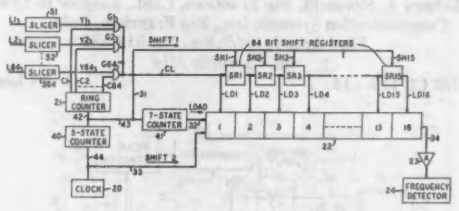
for jumping from the control of the computer by said group of flip-flops to the control thereof by said program permanent store and vice versa are provided. The first means comprises means for comparing the results of two consecutive potential tests, means for counting the number of consecutive tests with unchanged results and means, controlled by both said comparing means and said counting means, for inhibiting said flip-flops, transferring in the instruction address register the address contained in the auxiliary instruction address register and activating the program permanent store. The second means comprises means for detecting a jump instruction in the readout instruction register, transferring in the auxiliary instruction address register the address of the jump instruction, inhibiting the program permanent store and activating the group of flip-flops.

3,578,919

TIME COMPRESSION TONE DETECTOR

John F. O'Neill, Eatontown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 30, 1968, Ser. No. 787,876
Int. Cl. H04m *1/50*; **H04q** *5/10*
U.S. Cl. 179—84 **15 Claims**



In a frequency detection device time compression techniques are utilized for detecting the presence of a predetermined tone on any one of a plurality of communication channels. Signals appearing on the plurality of channels are sequentially sampled and stored in digital form. Information relating to individual channels is read out of storage and

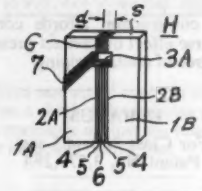
sent to the frequency detection device at a rate greater than the rate at which the individual channels are sampled.

3,578,920

FERRITE MAGNETIC HEAD WITH GAP SPACER OF SILICON OXIDE AND METAL OXIDES

Noriaki Okamoto, Kanagawa-ken; Teruo Wakabe, Tokyo, and Kazuo Nozawa, Chiba-ken, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 12, 1969, Ser. No. 806,477
Claims priority, application Japan, Mar. 15, 1968, 43/16853
Int. Cl. G11b 5/24, 5/42
U.S. Cl. 179—100.2C 3 Claims



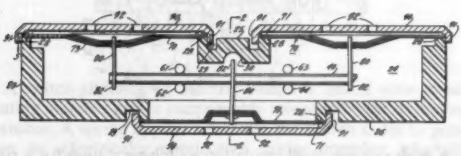
A magnetic head has a gap spacer between magnetic core members thereof, which spacer is constituted by at least one layer of a nonmagnetic metal oxide formed over a protective layer, such as, silica dioxide, on a gap-defining surface of the magnetic core members. The metal oxide layer is formed over the protective layer by heating on the latter an acid solution of a nonmagnetic metal halide or a solution of an organic metal salt, during which heating the protective layer prevents oxidation and etching of the underlying gap-defining surface.

3,578,921

MINIATURE MULTIPLE-DIAPHRAGM ACOUSTIC MECHANOELECTRIC TRANSDUCER DEVICE

William F. Knauert, Yonkers, N.Y., assignor to Sonotone Corporation, Elmsford, N.Y. Continuation of Ser. No. 634,736, Apr. 28, 1967, abandoned

Filed Jan. 26, 1970, Ser. No. 6,035
Int. Cl. H04r 7/00
U.S. Cl. 179—139 5 Claims



A miniature size electroacoustic signal transducer device has an elongated mechanoelectric transducer connected to a plurality of diaphragms for multiplying the transduced signal output.

ERRATA

For Classes 200—11, 200—148 see:
Patent Nos. 3,579,257 and 3,579,258

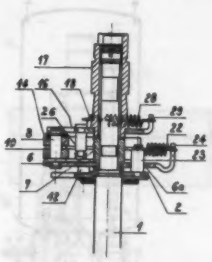
3,578,922

IGNITION DISTRIBUTOR

Roger Habert, Paris, France, assignor to Ducellier & Cie, Paris, France

Filed July 25, 1969, Ser. No. 845,019
Claims priority, application France, Aug. 1, 1969, 161489
Int. Cl. H01h 19/00
U.S. Cl. 200—19R 2 Claims

The advance curve of an ignition distributor is tailored to provide a desired degree of advance at cranking speed, a desired degree of retardation at low or engine idling speed, and thereafter a normal advance curve as the engine speed increases. The desired curve is obtained by the use of two



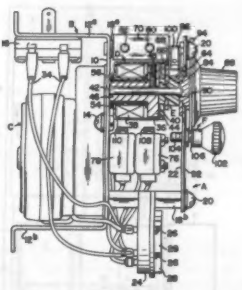
sets of centrifugal weights carried by an intermediate plate and having pins engaging in respective cam slots of a lower plate fixed to the distributor shaft and an upper plate fixed to the distributor cam.

3,578,923

ELECTROMAGNETICALLY CLUTCHED RESET TIMER

Fred E. Morey, III, and George B. Mork, Baraboo, Wis., assignors to Gulf & Western Industries, New York, N.Y.

Filed Jan. 16, 1969, Ser. No. 791,702
Int. Cl. H01h 7/08, 43/10, 3/32
U.S. Cl. 200—38 13 Claims



An adjustable reset timer comprising: a frame, a motor, and electromagnetic clutch assembly, drive means for interconnecting said motor and said clutch assembly, a clutch armature axially movable into and out of magnetically locked engagement with said clutch assembly and adapted to rotate in an operative direction from an initial preselected position to a final position, at least one switch affixed to said frame at a point corresponding to said final position, means for actuating said switch when said armature is in said final position, and means for selecting the initial position.

3,578,924

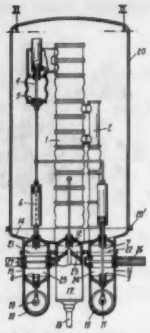
METAL CLAD SWITCH GEAR FOR HIGH VOLTAGES

Rintje Boersma, Harmelen, Netherlands, assignor to N. V. "KOQ" Utrecht, Netherlands

Filed Apr. 11, 1969, Ser. No. 815,345
Claims priority, application Netherlands, Apr. 23, 1968, 6,805,720
Int. Cl. H01h 31/00
U.S. Cl. 200—48 10 Claims

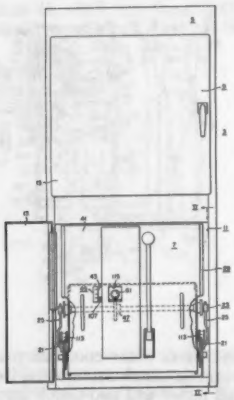
Metal clad switch gear for high voltages, all switches and accessories belonging to the same phase of a switching unit of the switch gear being accommodated in a common metal

vessel which consists of a base member supporting said switches and accessories and a hood which is detachably



secured with its lower rim to said base member and encloses said switches and accessories while remaining clear thereof.

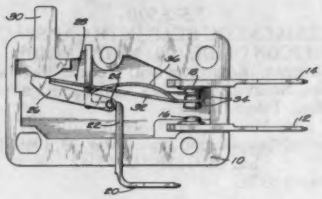
3,578,925
DRAWOUT-TYPE SWITCHGEAR
John L. Drown, Monroeville, and Nagar J. Patel, East McKeesport, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Nov. 24, 1969, Ser. No. 879,189
Int. Cl. H01h *9/20*
U.S. Cl. 200—50 **8 Claims**



Drawout-type switchgear comprises a levering-in mechanism for levering a circuit-interrupting unit into a connected position in a cell with improved means stopping movement of the circuit-interrupting unit when the circuit-interrupting unit reaches the connected position.

3,578,926
SNAP SWITCH
George Obermann, Niles, Ill., assignor to Controls Company of America, Melrose Park, Ill.
Filed Dec. 4, 1969, Ser. No. 882,080
Int. Cl. H01h *13/36*
U.S. Cl. 200—67 **3 Claims**

The compressed tongue of the switch blade is pivoted on the fixed support member while the side rails are under tension. The actuated end of the blade has integral pivot arms bent at 90° from the plane of the blade and pivoted on ears projecting from the support member. When the plunger is depressed, the side rails pass the pivot point of the tongue and cause the contact carrying end of the blade to snap

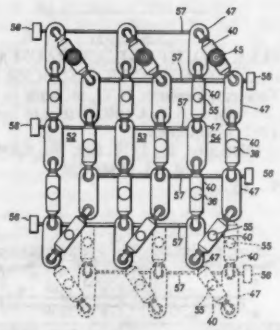


downwardly. The construction affords considerable overtravel with no adverse effect on contact pressure. The switch provides a high degree of contact wiping.

ERRATUM

For Class 200—83 see:
Patent No. 3,579,284

3,578,927
HIGH VOLTAGE SWITCHING ASSEMBLY
Adrian W. Roth, Aarau, Switzerland, assignor to Sprecher & Schuh AG, Aarau, Switzerland
Filed Feb. 26, 1969, Ser. No. 802,604
Claims priority, application Switzerland, Feb. 29, 1968, Mar. 21, 1968, 3073/68;4413/68
Int. Cl. H01h *33/64, 9/40*
U.S. Cl. 200—145 **7 Claims**

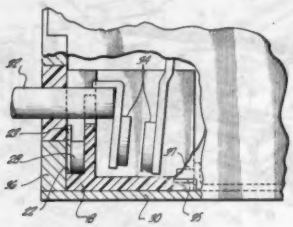


A high-voltage, fluid insulation switching station for a ring bus bar arrangement built up on a separate phase basis, having switching assemblies including three individually enclosed circuit breakers, earthing switches, instrument transformers and voltage transformers, cable dividing boxes and outdoor lead-throughs, the three circuit breakers with associated earthing switches and current transformers required for each connecting point of the bus bar arrangement being arranged within a T-shaped metal housing, wherein the individually enclosed circuit breakers of any one phase in parallel rows form, in sequence with T-shaped housings, a ring arranged, with like parts of the three phases being disposed on axes perpendicular to said parallel rows of circuit breakers.

3,578,928
SPRING MOUNTED ARC DEFLECTOR
John C. Schuessler, West Covina, and Roman J. Capol, Norwalk, Calif., assignors to Leach Corporation, South Pasadena, Calif.
Filed Nov. 22, 1968, Ser. No. 778,109
Int. Cl. H01h *9/34, 33/04*
U.S. Cl. 200—144 **3 Claims**

An improved arc deflector having a backing plate, a plurality of spaced-apart walls, and a recessed partition, which

members define compartments having an end wall and opposed sidewalls. A set of contacts of an electrical relay are enclosed within each compartment, the walls acting to



prevent arcing from one set of contacts to another. A retaining spring seats on a shelf of the backing plate and biases the compartmented enclosure against the relay container to hold the arc deflector immobile during use.

3,578,929

SLIDER SWITCH WITH ADJUSTABLE ABUTMENT ON FRAME, AND STATIONARY CONTACT FACES WITH AN ANGLE GREATER THAN 180° THEREBETWEEN BRIDGED BY A FORK SHAPED BRIDGING CONTACT

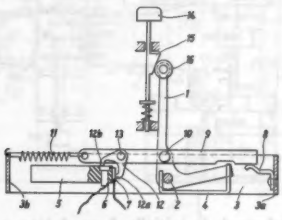
Horst Priebs, Bielefeld, Germany, assignor to Anker-Werke Aktiengesellschaft, Bielefeld, Germany

Filed Jan. 15, 1968, Ser. No. 697,885

Claims priority, application Germany, Jan. 17, 1967, A54637

Int. Cl. H01h *1/20, 1/18, 3/46*

U.S. Cl. 200—153 **7 Claims**



A switch slider of an electric switch is linked with an actuating member and is reciprocably movable by the actuating member. A spring applies a force to the switch slider to position an electrically conductive bridge member pivotally mounted on the switch slider in electrical bridging contact with a pair of spaced electrical contacts positioned in fixed relation to each other and to maintain good electrical contact between the bridge member and the contacts by relative motion of the bridge member and the contacts.

3,578,930

MULTIPLE ELECTRIC SWITCH

Wolfgang Tiefenthaler, Rosenheim, Wehrfleck, Germany, assignor to Messerschmitt-Bolkow Gesellschaft mit beschrankter Haftung, Munich, Germany

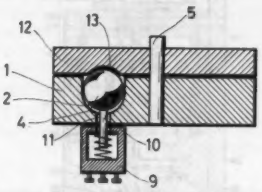
Filed Apr. 1, 1969, Ser. No. 811,799

Claims priority, application Germany, Apr. 6, 1968, Oct. 22, 1968, B75308;G6803301

Int. Cl. H01h *3/00*

U.S. Cl. 200—153 **7 Claims**

A multiple electric switch includes a spring-biased ball mounted as a locking element in a member connected to a switch shaft, and a plate formed with locking positions in the form of recesses and with guiding means to guide the ball relative to the recesses. Individual sets of switch contacts, such as microswitches, having respective operating members, are mounted as part of the switch and the operating members project into respective recesses for engagement by the ball when the latter enters the recess, to operate the associated switch contacts. The multiple switch may be a rotary switch, a linear switch or a band switch, and the band switch may be



combined with either the rotary switch or the linear switch. The recesses have a close conforming fit with the ball such that an operating member is actuated only when the ball is fully seated in the associated recess.

3,578,931

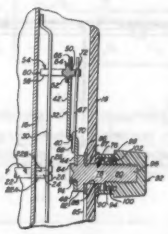
SELF-CLEANING ELECTRICAL SWITCH CONTACT

Frank W. Murphy, and Frank W. Murphy, Jr., 3131 S. Sheridan P.O. Box 45248, Tulsa, Okla. 74145

Filed Jan. 15, 1970, Ser. No. 003,112

Int. Cl. H01h *1/18*

U.S. Cl. 200—166BD **10 Claims**



An electrical switch including a movable switch arm, a switch contact engageable and movable with said switch arm to close an electric circuit, and wherein the contact is spring-biased to constantly engage within a seat and to wipe therein upon engagement and disengagement of said switch arm, and to return the contact to its original position.

3,578,932

REVERSIBLY MOUNTABLE LIMIT SWITCH CONSTRUCTION

Ronald W. Holmes, Freeport, Ill., assignor to Robertshaw Controls Company, Richmond, Va.

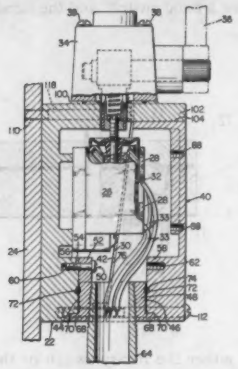
Filed June 17, 1968, Ser. No. 737,658

Int. Cl. H01h *9/02*

U.S. Cl. 200—168 **6 Claims**

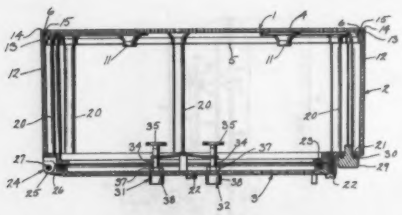
This application discloses a limit switch having a cup-shaped switch-supporting casing with an open rim, and a cup-shaped switch cover casing with an open rim. Either of these casings may be mounted on a support wall with its rim exposed. Then the other casing may cover the supported casing, rim to rim, to form a combined closed casing. The switch-supporting casing has an operator head at the top and a powerline-receiving notch at the bottom. The switch cover casing has a powerline-receiving notch at the bottom. Prong receptacle means may be added to the switch cover casing so

that the powerline terminals may be attached thereto and prongs may be added to the switch support casing, when the



switch cover casing is attached to the support wall as a plug-in installation.

3,578,933
CORROSION-RESISTANT ENCLOSURE
Woodrow A. De Smidt, and Edward H. Kuhn, Milwaukee, Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.
Filed Sept. 12, 1969, Ser. No. 857,512
Int. Cl. H01h *9/04*
U.S. Cl. 200—168 **7 Claims**



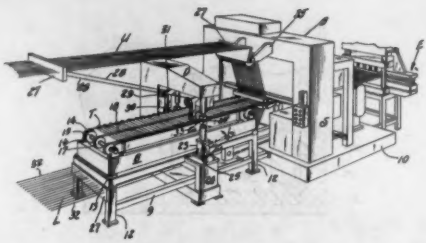
A corrosion-resistant enclosure is disclosed for electrical switches, such as across the line motor starters and safety disconnect switches, that is made of a reinforced resin. The enclosure has a unitary backplate with a backwall and forwardly turned flange, a four-sided body open at the back to receive the backplate and fit snugly about the backplate flange, a sealing material bonding the backplate and body together, and a cover hinged to the body by integral hinge straps that retain the sealed integrity of the enclosure. The components of the enclosure are of molded, reinforced resin having a high degree of resistance to corrosive environments.

ERRATA

For Classes 219—56, 219—98, 219—154, 219—295, 219—486 see:
Patent Nos. 3,579,259 thru 3,579,264

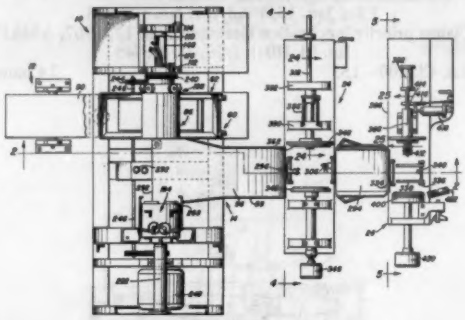
3,578,934
WIRE CONDENSER MAT WELDER AND METHOD OF FORMING
Rene G. Beauvais, 1614-3rd St., Bay City, Mich. 48706
Division of Ser. No. 582,042, Sept. 26, 1966, Pat. No. 3,460,225.
Filed Feb. 24, 1969, Ser. No. 825,468
Int. Cl. B23k *11/00*; B63h *9/04*
U.S. Cl. 219—56 **17 Claims**

Apparatus for manufacturing wire condenser mats wherein at least one rigidifying wire is spot welded to a series of cross-wisely extending connected loops to rigidify the mat structure and insure proper spacing of the loops. The rigidified



structure is then passed to a second welding station where a wire field is welded to the loops to complete the condenser mats.

3,578,935
AUTOMATIC DRUM-FORMING MACHINE
Clifford T. Deane, St. Albans, W. Va., assignor to Stampco, Inc.
Filed Feb. 10, 1969, Ser. No. 816,137
Int. Cl. B23k *1/16*
U.S. Cl. 219—64 **15 Claims**

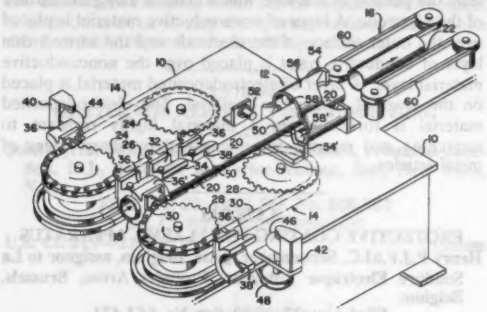


Sheet metal stock is initially formed into a cylinder by sequential cutting, bending and seam-welding operations. The cylinder then undergoes necking and flanging operations prior to transfer to a final assembly station at which a lid is applied and seamed to the cylinder as its wall is swaged. The cutting, welding and metal-deforming operations as well as transfer of the workpiece from one station to another is performed automatically by a hydraulic-electrical control system.

3,578,936
CONTAINER BODY SEPARATION UTILIZING RADIATION DISCRIMINATION
Howard L. Gerber, Chicago, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Filed Apr. 23, 1968, Ser. No. 450,391
Int. Cl. F27b *9/06*; F27d *11/00*
U.S. Cl. 219—388 **45 Claims**

An apparatus and method for separating tube portions from a continuous length of tubing is disclosed herein. The tubing is advanced past a marking station wherein a circumferential bank of heat absorbent material is applied to the tubing. The tubing is then advanced through a housing supporting radiant energy source provisions which direct radiant energy onto the tubing, the energy being absorbed by the circumferential band to effect severance of the tubing. A second conveyor moving at a slightly higher linear rate than

the tubing engages the severed tubing portion to assist separation at the circumferential band. Increase radiant energy absorption may, alternatively, be achieved by circumferentially scoring the tubing.

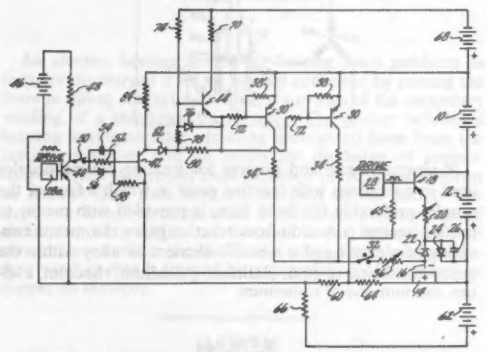


3,578,937

ELECTRICAL DISCHARGE MACHINING POWER SUPPLY CIRCUIT OF THE SUPERIMPOSED VOLTAGE TYPE

Kurt H. Sennowitz, Royal Oak, Mich., assignor to Elox Inc., Troy, Mich.

Filed Aug. 21, 1969, Ser. No. 852,023
Int. Cl. B23p 1/08
U.S. Cl. 219—69 **11 Claims**



A circuit for providing EDM machining pulses from a pair of different magnitude voltage sources. A pair of electronic switches such as transistors are employed to pulse the sources, either separately or additively to control the magnitude of the machining pulses applied and thereby control the mode of machining from roughing to finishing.

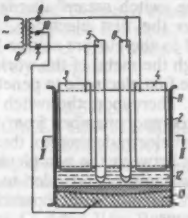
3,578,938

METHOD OF ELECTROSLAG WELDING

Boris Izailevich Medovar, Bulvar Lesi Ukrainki, 2, kv. 8; Daniil Andreevich Dudko, pereulok Mechnikova, 3, kv. 7; Vitaly Mikhailovich Baglai, ulitsa Semanshko, 10, kv. 54/3; Oleg Petrovich Bondarenko, Kreschatik, 15, kv. 34; Albert Nikolaevich Sevruk, ulitsa Ezhena Potie, 9, kv. 89; Rudolf Solomonovich Dubinsky, Brest Litovsky prospekt, 11, kv. 15; Vladimir Prokhorovich Andreev, ulitsa B. Kitaevskyaa, 99, kv. 13; Georgy Grigorievich Andrianov, Bulvar Lenina, 30, kv. 26; Valentin Stepanovich Sindeev, Bulvar Druzhby Narodov, 14, kv. 13; Anatoly Nikolaevich Safonnikov, ulitsa Filatova, 1/22, kv. 78, and Igor Ivanovich Suschuk-Sljusarenko, ulitsa Vyborgskaya, 80/17, kv. 94, Kiev, U.S.S.R.

Filed Apr. 8, 1969, Ser. No. 814,399
Claims priority, application U.S.S.R., Apr. 8, 1968, 1231246
Int. Cl. B23k 9/18
U.S. Cl. 219—73 **5 Claims**

A method of electroslag welding, enabling metal parts of great thickness to be welded together, wherein stationary and movable consumable electrodes are disposed equidistantly in relation to the surfaces of parts to be welded together, the movable electrodes being rigid and not bendable along the weld seam being made as they are immersed into a slag bath.

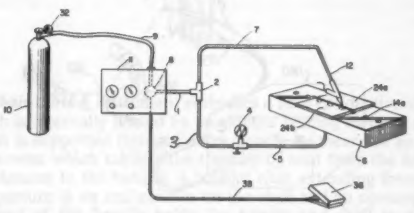


3,578,939

BACKING GAS ATTACHMENT SAVING DEVICE FOR HELIARC WELDING

Randolph E. Green, 8 Woodbine St., Roxbury, Mass. 02119

Filed Oct. 15, 1968, Ser. No. 768,200
Int. Cl. B23k 9/16
U.S. Cl. 219—74 **4 Claims**



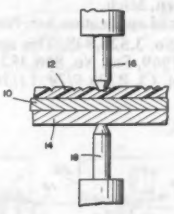
A backing gas attachment for conserving backing gas during heliarc welding provides simultaneous control of the flow of cover gas and backing gas to a piece being welded. This prevents waste of the backing gas when its use is not required.

3,578,940

WELDING PROCESS

Oran J. Sands, Columbus, Ind., assignor to Arvin Industries, Inc., Columbus, Ind.

Filed Feb. 20, 1969, Ser. No. 801,065
Int. Cl. B23k 9/28, 11/10
U.S. Cl. 219—91 **2 Claims**



A welding apparatus and method for spot welding a first metal workpiece having a plastic-covered surface to a second metal workpiece. The two workpieces are placed in metal-to-metal engagement and clamped between the electrodes of two aligned welding guns, a first electrode engaging the plastic surface of the first workpiece and a second electrode engaging the second workpiece. At a point spaced from the second electrode, the metal of the second workpiece is en-

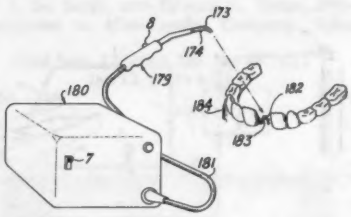
gaged by a contact member between which and the second electrode an electric current can flow through the metal. The second electrode is connected to one terminal of a welding-current source the other terminal of which is connectable through appropriate switch means alternatively to the contact member or to the first electrode. With the contact member connected to the current source heat generated by current flow through the metal of the workpieces softens the plastic to enable the first electrode to penetrate it and engage the metal substrate. Thereupon, the switch means is operated to disconnect the contact member from the power source and connect the first electrode thereto, thus permitting welding current to flow between the two electrodes through the metal. A timing mechanism is provided to control automatically the supply of current and the operation of the welding guns and switch means.

3,578,941

SURGICAL ELECTRIC WELDING APPARATUS

Jacques Robert Webert, Montrouge, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 7, 1969, Ser. No. 805,213
Claims priority, application France, Dec. 31, 1968, 182649
Int. Cl. B23k *11/26*
U.S. Cl. 219—114 **12 Claims**



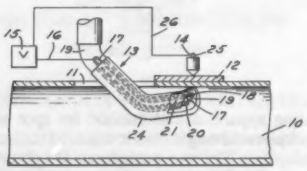
A surgical electric welding apparatus for interconnecting bone implantations, said apparatus comprising a transformer whose primary winding may be connected to an electric energy source, two welding electrodes connected to the terminals of the secondary winding of the transformer by means of a flexible cable and held in a handle, an electronic unit for controlling the closure of the feeding circuit of said primary winding and safety means for preventing said circuit from being improperly closed.

3,578,942

WELDING ELECTRODE ASSEMBLY

Leonard J. Bugaj, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of application Ser. No. 769,785, Oct. 23, 1968, now Patent No. 3,525,848. This application Oct. 14, 1969, Ser. No. 866,352
Int. Cl. B23k *9/24, 11/30*
U.S. Cl. 219—119 **7 Claims**



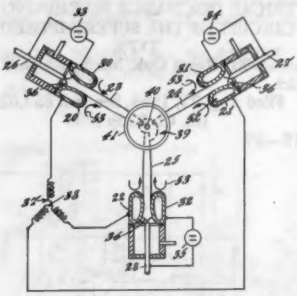
A welding electrode assembly includes a metal-welding electrode and a voltage-sensing wire welded at one end to the lower portion of the electrode. A layer of insulating material is positioned between the wire and the electrode along at least the portion of the wire which extends along the surface of the electrode. A layer of nonconductive material is placed over the outer surface of the electrode and the wire. A thin layer of conductive paint is placed over the nonconductive material layer. A layer of electrodeposited material is placed on the layer of conductive material. The electrodeposited material is formed from a material highly resistant to scratching and marring when engaged by sharp edges of metal articles.

3,578,943

PROTECTIVE COATING FOR PLASMA APPARATUS

Henry P.J.F.M.C. Schoumaker, Jette, Belgium, assignor to La Soudure Electrique Autogene, Procedes Arcos, Brussels, Belgium

Filed Aug. 27, 1969, Ser. No. 853,471
Claims priority, application Belgium, Mar. 19, 1969, 71,514
Int. Cl. B23k *9/00*
U.S. Cl. 219—121 **3 Claims**



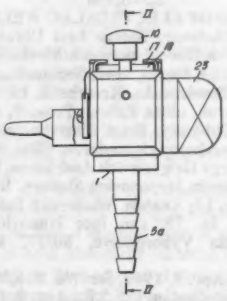
A plasma nozzle and process for treating plasma nozzles used in operations with reactive gases in which a face of the nozzle, preferably the front face, is provided with means to protect against corrosion from reactive gases, the means consisting of a coating of a metallic element or alloy within the group consisting of gold, platinum, palladium, rhodium, iridium, osmium and or ruthenium.

3,578,944

WELDING ASSEMBLAGE

Arieh Kermen, Dimona, Israel, assignor to The State of Israel, Atomic Energy Commission, Beer-Sheba, Israel

Filed June 18, 1969, Ser. No. 834,363
Claims priority, application Israel, July 4, 1968, 30308
Int. Cl. B23k *9/00*
U.S. Cl. 219—130 **3 Claims**



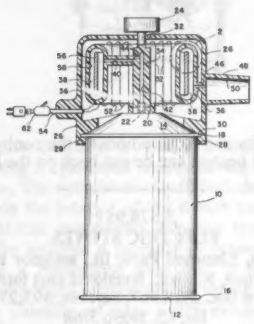
Welding equipment particularly for arc-welding a junction of two wires, for example, for forming a thermocouple junc-

tion wherein the junction is held by means of a gripping unit of substantial heat capacity, the gripping unit consisting of two constituent elements which can be displaced with respect to each other so as to vary the aperture defined between the elements and designed to receive the junction.

3,578,945
HEATER FOR AEROSOL FOAM-DISPENSING CONTAINERS

John Ayres, Mountainside, and Irving Reich, Princeton Junction, N.J., assignors to Carter-Wallace, Inc., New York, N.Y.

Filed Feb. 20, 1969, Ser. No. 800,982
Int. Cl. B67d *5/62*; H05b *5/00*
U.S. Cl. 219—214 **7 Claims**

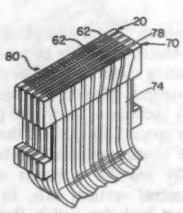


An electric heating device for heating foam products as they are discharged from an aerosol container by passing the foam in direct contact with the hot surfaces of the secondary winding of a stepdown transformer. The device includes a housing having an inlet admitting pressurized foam from the aerosol container and an outlet for discharge of unpressurized foam. A toroidal shell mounted in the housing forms an annular flow path between the inlet to the outlet. The stepdown transformer includes a multiturn primary wound about the outer surface of the shell and a cylindrical iron core centered within the shell and a single-turn closed secondary winding that is formed by a thin plating of cadmium or copper on the core.

3,578,946
THERMAL PRINT HEAD WAFER AND METHOD OF MAKING THE SAME

William L. Colello, Troy, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed Oct. 27, 1969, Ser. No. 869,700
Int. Cl. H05b *1/00*
U.S. Cl. 219—216 **17 Claims**

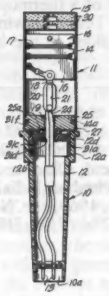


A thermal print head wafer including a dielectric substrate having one end whose sharp edges are removed (by grinding) to provide a continuous, blended surface between an intended printing surface of the substrate and opposed flat sides thereof. The blended surface has small grooves in the surface thereof, which grooves are aligned parallel to a direction in which the print wafer moves relative to a thermally responsive record medium with which the printing wafer is used. A layer of semiconductor material is deposited (by pulse spraying) on the blended surface while a portion of the substrate is heated in a furnace, and the deposited material is separated into discrete, spaced resistive elements by high-pressure spraying of abrasives at the semiconductor material through a slitted U-shaped mask. Electrical conductors (located on the opposed flat sides) of the substrate are connected to the ends of the resistive elements, enabling them to be selectively energized.

3,578,947
ELECTRICALLY HEATED HAIR-CURLING INSTRUMENT

Samuel L. McNair, Overland Park, Kans., assignor to The Songrand Corporation, Kansas City, Mo.

Filed May 3, 1968, Ser. No. 726,620
Int. Cl. A45d *2/36*; H05b *3/06*
U.S. Cl. 219—226 **1 Claim**

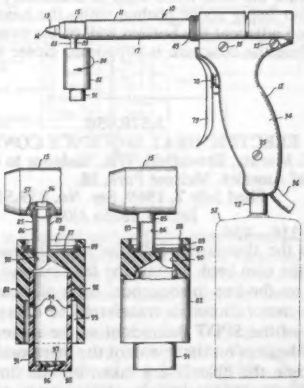


A hair-curling instrument embodies a heat conductive shell which is internally heated by an electric heating element and which is supported from a hollow handle by means of an arrangement which inhibits the transfer of heat from the heating element to the handle. A tubular rivet extending through an aperture in an end closure on the shell and an opening in the end of the handle holds the handle and shell in axial alignment. The heating element leads pass through the rivet. Thermally nonconductive spacers secured to the handle end and seated in recesses in the shell end closure are interposed between the shell closure and the handle end so as to define air gap between the confronting surfaces of the handle end and the closure member.

3,578,948
SOLDERING AND DESOLDERING HAND TOOL EMPLOYING AIR BLAST OR SUCTION

Aaron L. Friend; Arthur G. Patterson, and James G. Wilen, Phoenix, Ariz., assignors to General Electric Company

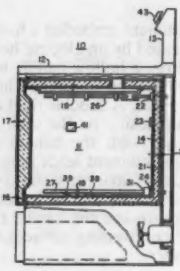
Filed Mar. 19, 1969, Ser. No. 808,573
Int. Cl. B23k *3/06*
U.S. Cl. 219—230 **24 Claims**



A soldering and desoldering device includes a heating unit and a soldering tip having an end for engagement with a sol-

dered joint and having a first passage opening at its end. A second passage is provided having an exit opening and communicating with the first passage such that pressure fluid flowing through the second passage out the exit opening is effective to aspirate air from the first passage. Means including a manually actuatable valve are provided for controllably supplying pressure fluid from a source of pressure fluid to the second passage. An adjustable device is mounted for adjustment between a first position wherein it prevents pressure fluid from leaving the exit opening and causes it to flow through the first passage out the end of the soldering tip, and a second position wherein it permits pressure fluid to flow out the exit opening to aspirate air from the first passage. A container is mounted by the adjustable device to form therewith a unitary structure, the container receiving molten solder which passes through the first passage and the exit opening from the soldered joint in response to actuation of the valve when the adjustable device is in its second position. The container is formed of a thermoplastic material, such as the material known as Teflon, having a nonstick finish to prevent adherence of solder to the inner walls of the container.

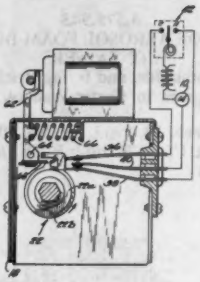
3,578,949
COMBINATION BAKE AND AUXILIARY BROIL HEATER FOR A COOKING APPLIANCE
Paul M. Weyrick, Ashland, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Apr. 4, 1969, Ser. No. 813,444
Int. Cl. F27d *11/02*; **H05b** *1/00*
U.S. Cl. 219—403 **5 Claims**



Cooking apparatus having a heater structure which is utilized both as a bake heater and a auxiliary broil element. The heater structure is characterized by its capacity to distribute heat over the entire oven when used as a bake heater and to concentrate the heat when used as a auxiliary broil element, the former being accomplished while the heater structure is positioned adjacent the bottom wall of the oven liner and the latter while the structure is supported closer to the top wall thereof.

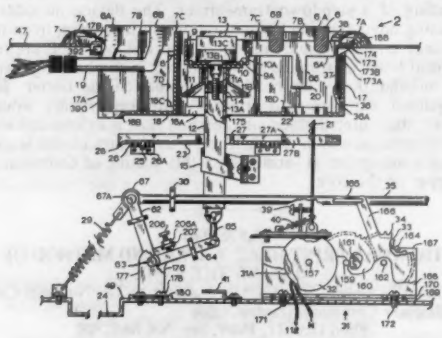
3,578,950
ELECTRIC HEAT SEQUENCE CONTROL
Clyde C. Moratz, Brookfield, Wis., assignor to Controls Company of America, Melrose Park, Ill.
Filed July 7, 1969, Ser. No. 839,511
Int. Cl. H05b *3/00*
U.S. Cl. 219—486 **6 Claims**

When the thermostat calls for heat the motor starts and rotates the cam bank to start the fan first and then place the heaters on the line in sequence. After all heaters are on the line the motor circuit is transferred to control by the cold contact of the SPDT thermostat so the motor will stop and keep all heaters on the line until the thermostat is satisfied at which time the heaters are taken off the line in sequence. Once the sequence starts it must be completed notwithstanding changes in the thermostat condition. The only exception is limit switch opening or power failure causing deenergization of the solenoid allowing the spring biased lever to open



all heater circuits and require homing the control at its starting point before heaters can be put back on the line.

3,578,951
ELECTRIC STOVES
Benedict Ingrao, Elmwood Park, Ill., assignor to John Ingro Jr., Albuquerque, N. Mex., fractional part interest
Filed Dec. 26, 1967, Ser. No. 693,270
Int. Cl. H05b *3/68*
U.S. Cl. 219—444 **50 Claims**



Electric stoves in which the relative vertical movement of a pot support and an electric heating element is controlled to control heat, the heating element and the pot support having surface means in horizontal planes. The surface means of the heating element may include at least one portion interposed between horizontally spaced portions of the surface means of the pot support, the heating element preferably including a plurality of generally annular portions at differing radial distances from a central vertical axis. In another embodiment, the pot support includes a thin flat plate portion. In one type of construction, the heating element is moved vertically while in another the pot support is moved vertically. Important features of the invention relate to means for controlling the relative vertical movement, both manually and automatically, with temperature sensing means being usable in conjunction with the control. The control means may control electrical energization of the heating element while also controlling the relative movement of the heating element and the pot support.

3,578,952
TUBULAR ELECTRICAL HEATING ELEMENT WITH A SEGMENTED HELLICAL FIN

Robert C. Boose, Mayes, Okla., assignor to Escoa Fintube Corporation, Pryor, Okla.

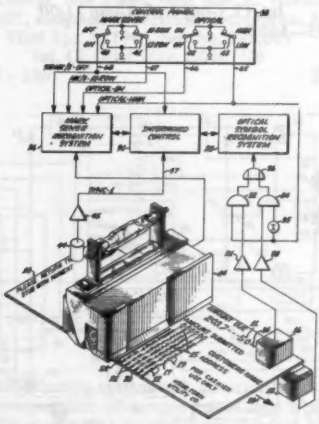
Filed June 5, 1969, Ser. No. 838,722
Int. Cl. H05b *3/50*
U.S. Cl. 219—540 7 Claims

The disclosure describes a tubular electrical heating element comprising a cylindrical sheath having a helical fin attached thereto. The cylindrical sheath includes a heating coil disposed within the interior of the sheath and a quantity of insulating material compacted between the coil and the sheath. The fin includes a plurality of segmented L-shaped blades having a continuous base that is helically wound around the cylindrical surface of the sheath and is bonded thereto by a plurality of spot welds extending along the length of the base.

3,578,953
SYSTEM FOR READING INTERMIXED MARKS AND SYMBOLS FROM DOCUMENTS

Richard E. Milford, and George Maclean, Phoenix, Ariz., assignors to Honeywell Information Systems Inc.

Filed Oct. 3, 1968, Ser. No. 764,660
Int. Cl. G06r *7/00*
U.S. Cl. 235—61.11 12 Claims



A system for automatically reading marks and symbols printed on one or more sides of a document in one or more different formats.

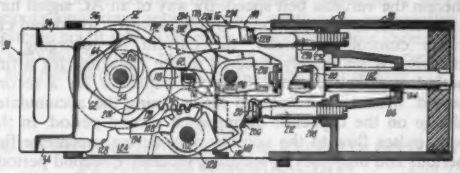
ERRATA

For Classes 235—61, 235—155, 235—189 see: Patent Nos. 3,579,265 thru 3,579,268

3,578,954
HIGH SPEED MAGNETIC COUNTER

James P. Barrett, West Hartford, and John G. Gamble, Weatogue, Conn., assignors to Veeder Industries, Inc., Hartford, Conn.

Filed Oct. 4, 1967, Ser. No. 672,786
Int. Cl. G06m *1/04*
U.S. Cl. 235—92 12 Claims

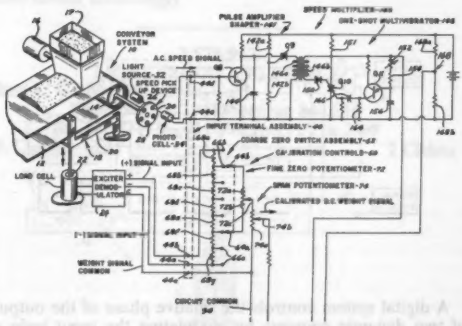


A resettable high speed magnetic counter includes a drive mechanism which permits the unidirectional advance of the counter's number wheels by retracting independently mounted verge drive arms. The reset button of the counter is adapted to spread the independent verge arms during the reset operation to thereby disengage the verge from the star wheel and enable the use of a direct driving engagement between the star wheel and the lowest order number wheel. The reset mechanism of the counter provides for delayed withdrawal of the reset fingers from the heart shaped reset cam after reset of the number wheels pending reengagement of the transfer pinions with the gears of the number wheels. The transfer pinions of the counter are suitably contoured to enable only transfer in a single rotatable direction with an interference lock preventing rebound inaccuracies. The magnet employs an E-shaped core limiting the flux path of the magnet to the core and flux plate while eliminating the clapper pivot from the flux path.

3,578,955
TOTALIZER FOR INTEGRATING THE PRODUCT OF TWO VARIABLES WITH DIGITAL REGISTRATION

Gerald P. Kloven, White Bear Lake, Minn., assignor to Ramsey Engineering Company, St. Paul, Minn.

Filed Mar. 18, 1968, Ser. No. 713,758
Int. Cl. H03k *25/02*
U.S. Cl. 235—92 15 Claims



A capacitor is charged with a DC current obtained from a voltage signal that is proportional to a first variable, such as the weight of material on a prescribed section of a conveyor belt. Each time that the accumulated charge on the capacitor reaches a specific level, the capacitor is automatically discharged to provide an output pulse. The repetition rate or frequency of these pulses is proportional to the signal voltage and hence the magnitude of the first variable. By causing these pulses, or a percentage of such pulses, to flow to a pulse counter, the count registered during the period of pulse

flow will indicate the time integral of the first variable, and in the conveyor case the amount of conveyed material when the belt is moving at a constant speed.

However, where the integral is influenced by another process variable, such as a variance in the conveyor belt speed, the count that is registered will not be an accurate indication of the total material discharged from the conveyor. Provision is made for modifying the number of pulses reaching the counter so that the total pulse count will reflect therein the variable belt speed. By way of an AC signal having a frequency proportional to the conveyor speed and circuitry controlled thereby, the current for charging the capacitor is alternately directed to the capacitor for a first period and then diverted from the capacitor for a second period. Means are employed for retaining the accumulated charge on the capacitor during each second period. In this way, pulses flow to the counter only during successive first periods and no pulses flow during successive second periods. By making the ratio of pulse flow time to total time, that is, the ratio of each first period to the sum of that first period and the following second period, proportional to the magnitude of the second variable, which is the belt speed in the illustrated situation, the counter registration then indicates the product of the two variables. In other words, there is produced a speed integral in which the counter registration denotes the quantity of material discharged from the conveyor even through both the rate of material and the belt speed vary.

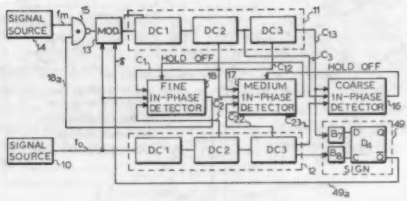
The capacitor is discharged many times each second. Pulse-divider circuitry accurately divides this high pulse rate down to a more usable range, thereby utilizing the above-mentioned percentage of pulses. A rate member is included and provision is made for providing a coarse zero and fine zero setting to indicate both zero rate on the meter and a zero counting rate on the counter for the condition of either (or both) the magnitude of the DC voltage or the frequency of the AC signal being zero. By means of a span adjustment a wide range in magnitudes of the DC input signal can be made to represent full scale on the rate meter.

3,578,956

PHASE MODULATOR OF TWO DYNAMIC COUNTERS

Amiel J. McCall, South Euclid, Ohio, assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed May 13, 1969, Ser. No. 824,065
Int. Cl. G06m *3/08*
U.S. Cl. 235—92cc **9 Claims**



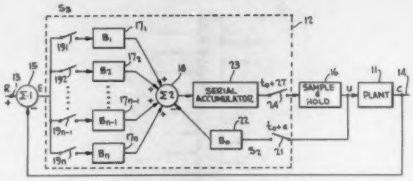
A digital system controls the relative phase of the outputs of two dynamic counters by modulating the input train of pulses to one counter until the two counters are accurately in phase. In the system, successively releasable coarse, medium, and fine in-phase detectors, operating at successively higher frequencies, are employed to permit modulation to occur until the desired in-phase accuracy is obtained. The coarse in-phase detector first detects an in-phase condition causing release of the medium in-phase detector, which next detects an in-phase condition causing release of the fine in-phase detector which provides the final in-phase detection that terminates the modulation. During the entire modulation period, a lead-lag detector controls the direction in which the input train of pulses to the one counter is modulated.

3,578,957

SAMPLED DATA CONTROLLER

James A. Gatlin, Bowie, Md., assignor to the United States of American as represented by the Administrator of the National Aeronautics and Space Administration

Filed May 29, 1969, Ser. No. 828,984
Int. Cl. G05b *21/02, 11/10;* G05d *1/08*
U.S. Cl. 235—150.1 **13 Claims**



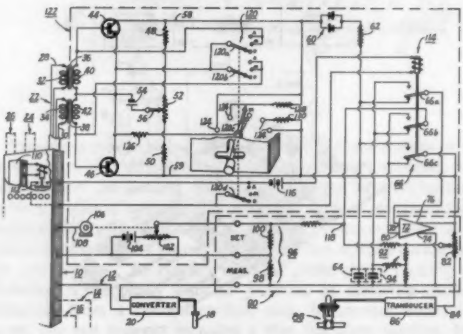
A sampled data feedback controller includes means for deriving a plurality of error signals within a single control formulation time interval. The error signals are derived by comparing the response of a plant with a reference input, constant over the interval, in a servo subtraction node. Each of the sampled errors is applied to an accumulator with a weighting factor, having a value selected on a predetermined basis, determined by the plant characteristics, to provide finite plant settling time. At the end of each control formulation interval the previous output of the accumulator is fed back to the accumulator, through a weighting factor network. The output of the accumulator at the end of each formulation interval is applied as a control input to the plant. In a specifically disclosed embodiment, the plant is a spin stabilized, attitude controlled satellite.

3,578,958

DIGITAL AND ANALOG PROCESS CONTROL APPARATUS

David A. Richardson, Sheldonville, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Continuation of application Ser. No. 582,750, Sept. 28, 1966, now abandoned. This application July 8, 1969, Ser. No. 845,642
Int. Cl. G06j *3/00;* G06p *11/00*
U.S. Cl. 235—150.5 **21 Claims**

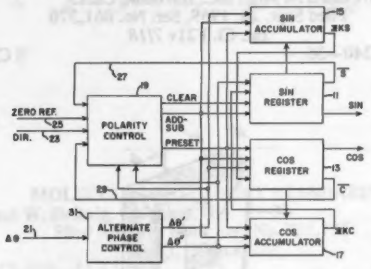


Industrial process control apparatus in which a digital computer is utilized for controlling the process, the controlled process loops of the digital computer system being provided with analog "backup" controllers. In the event of failure, control of the process condition is automatically switched to the analog controller which takes over the functions previously carried out by the digital computer.

3,578,959
DIGITAL RESOLVER WITH ALTERNATELY PHASED DIGITAL DIFFERENTIAL ANALYZERS

Donald W. Perkins, Dewitt, N.Y., and William E. Wickes, Manhattan Beach, Calif., assignors to General Electric Company

Filed Dec. 22, 1967, Ser. No. 692,889
Int. Cl. G06f 7/38, 15/32, 15/24
U.S. Cl. 235—152 8 Claims

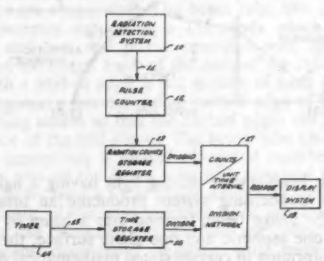


A resolver is described for transforming position vectors from polar to Cartesian coordinates and resolving such vectors into orthogonally related components defined by sine and cosine functions of the vector angle. This transformation is accomplished digitally in the systems as described using digital differential analyzers which iteratively sum or extrapolate the sine and cosine functions in steps each taken in response to an input pulse representing a small increment of vector angle. For purposes of optimized accuracy the sine and cosine functions are sequentially incremented by extrapolating a first of the two functions using present values of both and extrapolating the other using the extrapolated value for the first. This sequence is reversed with each input pulse, and is effected by time delay and/or anticipation means operative to differentially phase the sine and cosine extrapolations and to alternate the order or sequence in which they are computed.

3,578,960
RADIATION DETECTION SYSTEM WITH AUTOMATIC SAMPLE COUNTING RATE DETERMINATION

Heinz W. Georgi, San Diego, and Roy E. Nather, Solana Beach, Calif., assignors to Beckman Instruments, Inc

Filed Apr. 6, 1966, Ser. No. 540,609
Int. Cl. G06f 7/39; G01t 1/16
U.S. Cl. 235—156 11 Claims

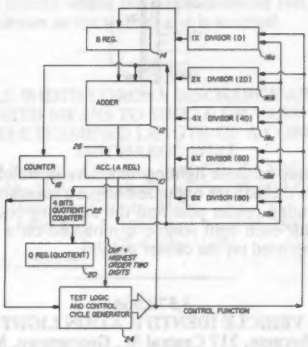


A radiation detection system with automatic and continuous online computation of sample count rate is disclosed. Logic circuitry is provided by which count pulses are added to a X register and subtracted from a dividend register. A comparator circuit is provided to detect the condition of identical tally in the X register and a timer register. Upon comparison and tally coincidence of the X register with the timer register, a means to increment a quotient register is provided. Such incrementation is continued until the dividend register is reduced to zero as indicated by the negative detection circuit provided therefor. The quotient register thereby contains the number of times the timer register can be divided into the dividend register. Other circuitry is provided to transfer the counts from a sample radiation detector into the dividend register. Therefore, at the end of computation the quotient register contains the sample count rate desired. Further logic circuitry and a cycle phase counter circuit are provided to accomplish division in a time substantially less than the elapsed measurement time period. By this logic means the various registers are incremented or decremented, as the case may be, at higher decade levels in the register progressing to lower decade levels as the logic circuitry and cycle phase counter direct, thereby providing a short computational time approaching a continuous presentation of sample count rate. Automatic compensation for undesired background counts is provided by means of digital circuits for subtraction of such count from the quotient register.

3,578,961
PRE-CONDITIONED DIVISOR FOR EXPEDITE DIVISION BY SUCCESSIVE SUBTRACTION

Ming-tzer Miu, Brighton, Mass., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Mar. 6, 1968, Ser. No. 710,918
Int. Cl. G06f 7/52
U.S. Cl. 235—159 12 Claims

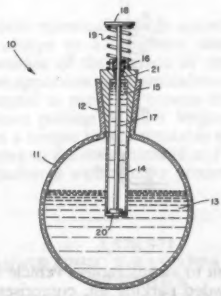


A digital divider wherein the divisor is first preconditioned to a value which renders it more easily divisible into the dividend. Once the divisor has been optimized and the value of the dividend adjusted accordingly, actual division is effected by alternately testing the high order digits of the partial remainder and subtracting multiples of the preconditioned divisor accordingly.

3,578,962
LIGHT PRODUCING DEVICE

Robert L. Gerber, Ridgecrest, Calif.

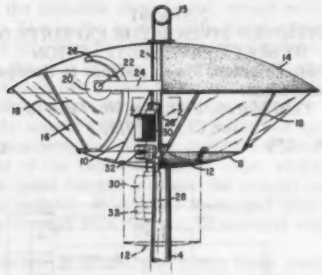
Filed July 25, 1969, Ser. No. 844,810
Int. Cl. F21v 9/16; C09k 1/02; F21k 2/00
U.S. Cl. 240—2.25 2 Claims



A chemiluminescent light-producing device comprising a glass flask containing an oxalate ester and fluorescer in a solvent and having provided in the neck of said flask a tube

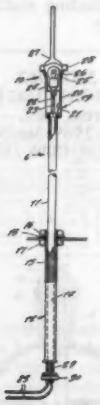
holding hydrogen peroxide which when released by appropriate means reacts with the oxalate ester to produce light.

3,578,963
LIGHTING FIXTURE
Hendrik A. J. De Vos, Wenham, and Thomas Haraden, Ipswich, Mass., assignors to Sylvania Electric Products Inc.
Filed Nov. 1, 1967, Ser. No. 679,758
Int. Cl. F21v *21/00*
U.S. Cl. 240—3 3 Claims



A multilamp outdoor lighting luminaire in which the major components thereof are organized about a substantially cylindrical, extruded center post and the auxiliary equipment associated with each light source is mounted on a power tray slidably supported on the center post.

3,578,964
VEHICLE IDENTIFICATION LIGHT
Ralph H. Sherman, 217 Central St., Georgetown, Mass.
Filed Jan. 21, 1969, Ser. No. 792,633
Int. Cl. B60q *1/26*
U.S. Cl. 240—8.1 4 Claims

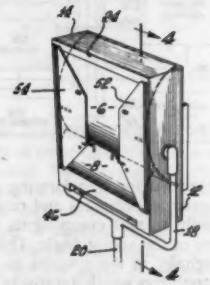


A light attachment to an automotive vehicle for identifying it rapidly in a crowded parking lot, comprises an upwardly telescopic staff carrying a lamp upon the upper end thereof. The lamp is electrically powered by conductor wires extending downwardly through the staff and connected to the automobile battery electrical power.

ERRATUM

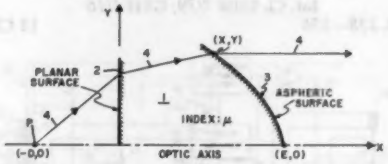
For Class 240—10.68 see:
Patent No. 3,579,269

3,578,965
FOLDABLE LUMINAIRE
Joseph N. Tawil, Woodland Hills; George R. Hartz, Canoga Park, and Edmund F. Walsh, Reseda, Calif., assignors to Berkey/Colortran Mfg., Inc., Burbank, Calif.
Filed Sept. 26, 1969, Ser. No. 861,370
Int. Cl. F21v *7/18*
U.S. Cl. 240—36 8 Claims



The reflector part of the luminaire is made in sections hinged to the main housing. Each section is foldable from a first extended operative position in which the sections project rearwardly away from the reflector opening to a second position in which all of the sections are located close to the plane of the opening of the reflector.

3,578,966
VEHICLE DRIVING LIGHT
Robert E. Levin, Hamilton, Mass., assignor to Sylvania Electric Products Inc.
Filed Nov. 5, 1969, Ser. No. 874,097
Int. Cl. F21v *5/04, 13/02*
U.S. Cl. 240—93 4 Claims

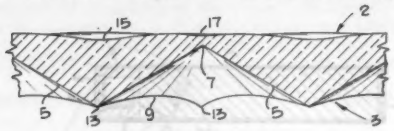


A vehicle headlight or driving light having a light source and optical condensing system producing an image at an aperture, the image being focused into a beam by the lens, which has one aspheric and one plane surface, the aspheric surface conforming to certain stated mathematical equations. The condensing system can be an ellipsoidal reflector with a light source at one focus and the image at the other. The plane surface can have a light control element on it if desired to produce small deviations in the shape of the beam.

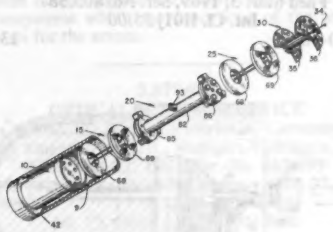
3,578,967
PRISMATIC LIGHTING PANEL
Leo G. Stahlhut, Kirkwood, and Leo J. Horvath, St. Louis County, Mo., assignors to K-S-H, Inc., St. Louis, Mo.
Filed Aug. 27, 1969, Ser. No. 853,409
Int. Cl. F21v *5/00*; G02b *17/00*
U.S. Cl. 240—106 3 Claims

A ⅛-inch plastic lighting panel having recessed conical

prisms on ¼-inch centers. The cones are one-tenth inch deep.



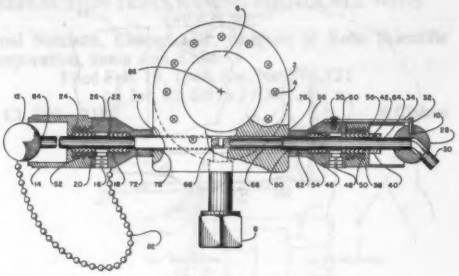
3,578,968
MOLECULAR FREQUENCY STANDARD
Helmut W. Hellwig, Oakhurst, N.J.
Filed Apr. 16, 1968, Ser. No. 721,776
Int. Cl. G01n *27/78*
U.S. Cl. 250—41.3 **2 Claims**



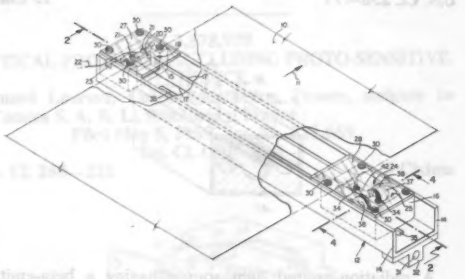
A molecular beam tube frequency standard using a barium oxide molecule of the form $Ba^{138}O^{16}$ having spinless atoms and using electrostatic state selection. The beam tube comprises a beam source including a thin-walled refractory electrically conductive oven tube containing $Ba^{138}O^{16}$. The oven tube, which is chemically inert to barium oxide, is surrounded by a thermionic electron emitter which is made negative with respect to the oven tube. Electrons emitted from the electron emitter bombard the oven tube and heat the barium oxide to a temperature at which $Ba^{138}O^{16}$ molecules are evaporated. The beam tube also comprises a cavity resonator supporting a TM mode which includes a cylinder and two end pieces provided with apertures for passage of the beam. Each of the ends of the cylinder is provided with a barbed edge; a flat surface of each end piece is pressed against a corresponding barbed edge of the cylinder by mounting means so that the barbed edges cut slightly into the surface of the end pieces. The beam tube also includes a detector comprising a heated elongated member stretched along the axis of the beam tube and arranged to intercept beam particles over a focal region extending along a portion of the length of the said member. Ions are formed in the vicinity of the elongated member and are collected by electrode means maintained negative with respect to said member.

3,578,969
SOLID SAMPLE INLET SYSTEM FOR A MASS SPECTROMETER
Walter Proskauer, San Francisco, Calif., assignor to Electronic Associates Inc., Long Branch, N.J.
Filed Nov. 25, 1968, Ser. No. 778,602
Int. Cl. H01j *39/34*
U.S. Cl. 250—41.9 **8 Claims**

A system is disclosed for injecting solid material into an evacuated chamber without disturbing the pressure therein. Two rods are slidably mounted for extension into the chamber via sealed apertures at opposite ends thereof. A larger diameter rod may extend through the chamber and out the opposite ends. A smaller diameter rod carrying the solid material is interfit within the larger diameter rod. The larger rod is withdrawn as the smaller one is inserted.



3,578,970
VARIABLE WIDTH CORONA DISCHARGE APPARATUS WITH MEANS TO SHIELD OR VARY A PREDETERMINED LENGTH OF A CORONA DISCHARGE WIRE
David E. Michaud, Chicopee, and Nils L. Hakanson, West Springfield, Mass., assignors to The Plastic Coating Corporation, Hampden County, Mass.
Filed May 3, 1968, Ser. No. 726,386
Int. Cl. G03g *15/00*
U.S. Cl. 250—49.52C **13 Claims**

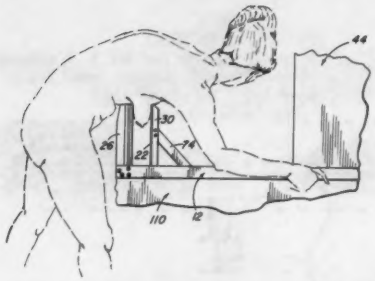


Variable width corona discharge apparatus for applying an electrostatic charge to a transverse dimension of variable width and position of the surface of strip material moving relative to the apparatus. One embodiment includes a movable shield adapted to mask the corona discharge wires along a predetermined portion of their length. Another embodiment includes a torque biased rotatable element transversely movable relative to the strip material and adapted to wind up the corona discharge wire along a predetermined portion of its length.

3,578,971
MAMMOGRAPHIC X-RAY APPARATUS AND TECHNIQUE
Harold J. Lasky, 55 E. Washington St., Evanston, Ill.
Filed Nov. 21, 1968, Ser. No. 777,923
Int. Cl. G03b *41/16*
U.S. Cl. 250—50 **5 Claims**

A method for radiographic examination of the female

breast comprising X-raying the breast under conditions of gentle compression and concurrent gravitational suspension



of the breast. Apparatus for carrying out the method of the invention.

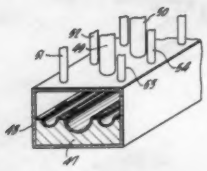
ERRATUM

For Class 250—51.5 see:
Patent No. 3,579,271

3,578,972
EXTENDED SELF-LUMINOUS LIGHT SOURCES EMPLOYING FIBER OPTICS

Harry H. Dooley; Robert J. Doda, and Arthur F. Mahon, Tucson, Ark., assignors to American Atomics Corporation, Tucson, Ark.

Continuation of application Ser. No. 552,109, May 23, 1966, now abandoned. This application Mar. 6, 1969, Ser. No. 805,041
Int. Cl. F21k *2/02*
U.S. Cl. 250—77 **15 Claims**



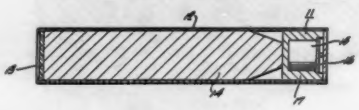
A radiation-excited light source having a beta-emitting radioisotope within a sealed tube. Illumination is provided by the impingement of betas upon phosphor material within the tube. "Fiber optic" light transmission media are affixed longitudinally along the exterior of the tube and feed light to a plurality of display locations. In one embodiment a thin layer of phosphor is coated over the entire inner surface of the tube. In another embodiment a thicker layer of phosphor is coated to a metal shell positioned within the tube.

3,578,973
SELF-LUMINOUS LIGHT SOURCES EMPLOYING FIBER OPTICS

Harry H. Dooley; Robert J. Doda, and Arthur F. Mahon, Tucson, Ariz., assignors to American Atomics Corporation, Tucson, Ariz.

Continuation of application Ser. No. 552,108, May 23, 1966, now abandoned. This application Mar. 6, 1969, Ser. No. 805,042
Int. Cl. G01n *23/00*
U.S. Cl. 250—71 **21 Claims**

A self-luminous light source in which "fiber optic" light transmission media are utilized to transmit light from a radiation-excited light source to one or more light display locations at predetermined distances from the radiation-excited source. In one embodiment the radioactive material within the source is completely surrounded by radiation shielding material such as lead and the "fiber optic" media follow a

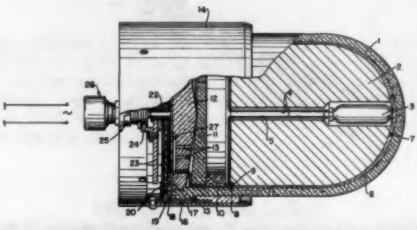


curved path within the shield. Other embodiments include apparatus for selectively presenting light of various colors and intensities to the input ends of the "fiber optic" light transmission media.

3,578,974
INFRARED SOURCE UTILIZING AN EXOTHERMIC CHEMICAL CHARGE HAVING STABLE AND NONSEGREGATING REACTION PRODUCTS

Raymond W. Thomas, Phoenix, and Abraham L. Pittinger, Scottsdale, Ariz., assignors to Talley Industries, Inc., Mesa, Ariz.

Filed Mar. 3, 1969, Ser. No. 803,587
Int. Cl. H01j *35/00*
U.S. Cl. 250—85 **13 Claims**



A radiant energy source is described comprising a crucible formed of a refractory material and containing an exothermic charge, the reaction products of which form a stable, nonsegregating matrix preventing large scale separation of the reaction products, thereby permitting the energy source to be mounted in a wide variety of attitudes. Cylindrical heat shields of varying lengths may be provided around the crucible permitting a variety of radiation patterns to be achieved, from a very narrow radiation cone up to slightly less than omnidirectional pattern. A valve is provided within the crucible for venting gases generated by the charge while sealing within the crucible any solid or liquid products of the reaction. A liner is disposed between the exothermic charge and the inner wall of the crucible for sealing the crucible wall against leakage of reaction products, thereby preventing deposits which would otherwise reduce the emissivity of the crucible wall.

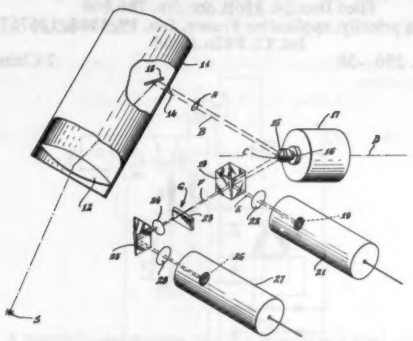
3,578,975
APPARATUS FOR MONITORING THE GUIDANCE AND FOCUS OF TELESCOPE

Chester C. Wheeler, Altadena, Calif., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed June 14, 1968, Ser. No. 737,181
Int. Cl. G01b *9/00*; **G01j** *1/26*
U.S. Cl. 250—203 **6 Claims**

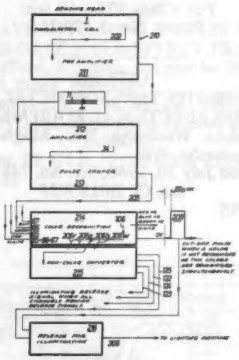
Guiding and focusing errors in a stellar telescope are detected automatically using photoelectric techniques. Light from a guidestar, collected by the telescope, is directed out of the telescope as a converging focusable beam and impinges on a high-speed chopping element. Guiding errors are detected by measuring the intensity of the emerging chopped light. An AC component in the output signal indicates an error. Focusing errors are detected by measuring the intensity

of the emerging chopped light after it strikes and is partly blocked by a knife edge positioned where the focus should occur. An AC component in the output signal indicates an



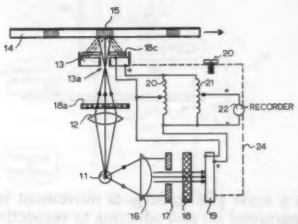
error. Both output signals are either read on meters or fed into servosystems which move portions of the telescope to compensate for the errors.

3,578,976
OPTICAL SCANNING DEVICE
Johannes Schunack, Berlin-Lichterfelde, Germany, assignor to Franz Morat G. m. b. H., Stuttgart-Vaihingen, Germany
Filed Aug. 21, 1967, Ser. No. 662,199
Claims priority, application Germany, Dec. 27, 1966, M72186
Int. Cl. G01n *21/30*; G01j *3/50*
U.S. Cl. 250—219 **12 Claims**



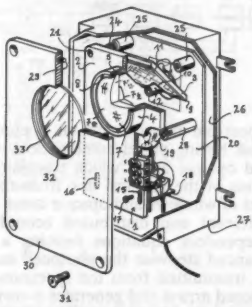
An arrangement for recording on programming tape the color pattern of, for example, fabric material. A scanning head having photosensitive apparatus scans the color pattern to be recorded on the tape, in a grid fashion. The photosensitive apparatus detects the colors on the pattern and converts the optical signals thus realized into corresponding electrical signals. After amplification, these signals from the photosensitive apparatus are converted into normalized pulses by being passed through pulse shapers. The latter provide pulses of constant amplitude and duration in the form of rectangular-shaped pulses. The latter are then applied to a color recognition circuit which provides a signal permitting recording on the programming tape when all designated colors on the pattern have been recognized. Through a systematic and orderly sequence of scanning and tape recording locations, the pattern and its color information is transferred onto the tape. This programming tape may then be used for controlling various machines, as for example, knitting or weaving machines for knitting or weaving predetermined color patterns.

3,578,977
REFLECTION TESTS HAVING PHOTOCELL WITH APERTURE
Samuel Natelson, Chicago, Ill., assignor to Rohe Scientific Corporation, Santa Ana, Calif.
Filed Feb. 19, 1968, Ser. No. 706,721
Int. Cl. G01n *21/30*
U.S. Cl. 250—219 **6 Claims**



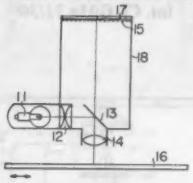
An instrument with supporting structure for reading relative density of flat spots and the concentration of substances in that spot, comprising in combination, a detector photocell with a small aperture in its center said photocell being supported in a plane parallel to that of the flat spot to be examined and in close proximity thereto, the light sensitive surface of the photocell facing said spot; a light source and lens combination so placed in back of the photocell as to focus a light beam at the aperture in the photocell, said light beam traversing said aperture to form a spreading light beam in front of the photocell so that emission of light from the spot will strike the photocell, causing a change in current in relationship with the density of the spot, and, electrical connecting means from said photocell for connection to readout means to sense the signal from the photocell.

3,578,978
OPTICAL PROJECTOR INCLUDING PHOTO-SENSITIVE DEVICE
Bernard Laurent, Corenc-Montfleury, France, assignor to Cometa S. A. R. L., Montfleury, France
Filed May 5, 1969, Ser. No. 821,669
Int. Cl. G01p *3/68*
U.S. Cl. 250—221 **5 Claims**



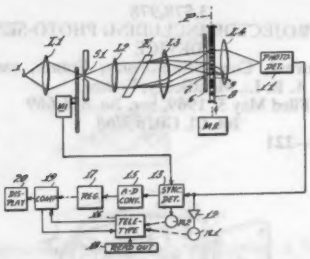
This invention relates to an optical projector for use in conjunction with a remote reflector which reflects a light beam from the projector. The projector may incorporate a photoelectric device for detecting variations in the light beam caused by movement of a body with respect to the light beam. The invention provides an optical projector comprising a light source and a lens which may be contained in a flat volume whose dimension in the direction of the optical axis is small with respect to the focal length of the lens.

3,578,979
ELECTRICAL SIGNAL GENERATING APPARATUS HAVING A SCALE GRID
Toshiji Kawaguchi; Takeo Tanaka, Tokyo-to, and Masaru Okada, Kawagoe-shi, Japan, assignors to Kabushiki Kaisha Tajima Seisakusho, Tokyo-to, Japan
Filed Dec. 18, 1968, Ser. No. 784,767
Claims priority, application Japan, Apr. 23, 1968, 43/26999
Int. Cl. G01b *11/04;* H01j *39/02*
U.S. Cl. 250—237 7 Claims



When a scale grid undergoes movement relative to index grids superposed on and adhering to respective photoelectric devices, the resulting variation in a bright-dark pattern formed by the grids is detected by the photoelectric devices and converted into electrical signals, which are processed and digitally displayed or utilized for control of machines and equipment.

3,578,980
SPECTRAL ANALYSIS USING MASKS HAVING DIFFERENT COMBINATIONS OF TRANSMITTING AND NON-TRANSMITTING PORTIONS
John A. Decker, Jr., Concord, Mass., and Martin O. Harwit, Ithaca, N.Y., assignors to Comstock & Wescott, Inc., Cambridge, Mass.
Filed June 18, 1969, Ser. No. 834,392
Int. Cl. G06k *9/00*
U.S. Cl. 250—237 14 Claims

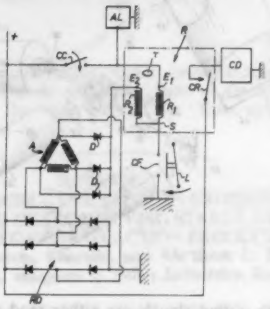


A light spectrum is projected on a photocell through a movable mask having plural combinations of arrays of light windows and opaque areas which transmit to or mask different portions of the spectral line from the photocell. The combinations of windows and opaque areas in the several arrays are different and distributed according to a set of linearly independent equations forming a matrix. As the mask is advanced stepwise the photocell successively senses all the light transmitted from the spectrum through successively interposed arrays and generates a corresponding group of values with an inverse of the mask matrix so as to derive a series of values representing the distribution of energy along the spectrum. The mask thus analyzes and encodes the spectral energy distribution.

ERRATUM

For Class 250—221 see:
Patent No. 3,579,047

3,578,981
ENGINE STARTER CONTROL CIRCUITS
Claude Edmond Lombard; Jean Henri Maurice, and Jean Piret, Billancourt, France, assignors to Regie National Des Usines Renault, Billancourt (Hauts de Seine), France and Automobiles Peugeot, Paris, France
Filed Dec. 24, 1968, Ser. No. 786,660
Claims priority, application France, Jan. 19, 1968, 136767
Int. Cl. F02n *11/08*
U.S. Cl. 290—38 2 Claims

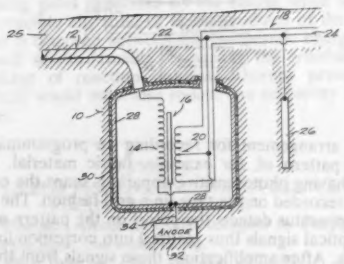


A starter motor control circuit contains a relay having two windings associated in opposed relationship, the first winding being energized through the medium of the ignition key switch and the second winding from the alternator through a special group of rectifying diodes of which the number is proportional to that of the phases of said alternator and the capacity consistent with the current drawn by the winding of the starter relay supplied therethrough.

ERRATUM

For Class 307—10 see:
Patent No. 3,579,285

3,578,982
CORROSION PROTECTION FOR METAL ENCLOSURES FOR ELECTRICAL EQUIPMENT
Rolland D. Nelson, Waukesha, Wis., assignor to RTE Corporation, Waukesha, Wis.
Filed July 30, 1968, Ser. No. 748,798
Int. Cl. H01b *7/28*
U.S. Cl. 307—95 6 Claims



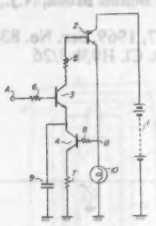
Disclosed herein is a metallic enclosure for electrical equipment used in an underground electrical distribution system which is isolated from the electrical distribution system ground and made cathodic by connecting the enclosure to a consumable anode buried in the ground in close proximity to the metallic enclosure.

3,578,983

TRANSISTOR-PROTECTING CIRCUIT

Yoshihiko Kondo, Nagoya, Japan, assignor to Nippon Denso Company Limited, Kariya-shi, Japan

Filed June 5, 1969, Ser. No. 830,646
Claims priority, application Japan, June 25, 1968, 43/44065
Int. Cl. H02h 7/20
U.S. Cl. 307—202 2 Claims



A transistor-protecting circuit comprising a load circuit including a source, a switching transistor and a load. A resistor, a second transistor for receiving an input signal and a capacitor are connected in series between the base of the first transistor and the interconnection of the load and the source. A third transistor and a resistor are further connected in series between the two plates of the capacitor to form a discharging circuit. The third transistor has its base connected to the interconnection of the load and the first transistor whereby when the load is short circuited to keep it in the cutoff state.

ERRATA

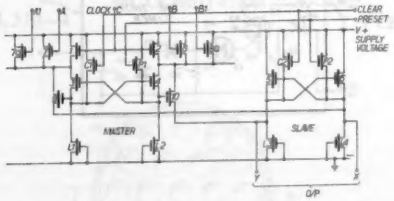
For Classes 307—25, 307—218, 307—221, 307—228 see: Patent Nos. 3,579,272 thru 3,579,275

3,578,984

MASTER/SLAVE SWITCHING CIRCUIT EMPLOYING INSULATED-GATE FIELD-EFFECT TRANSISTORS

John E. Ryley, Ilford, England, assignor to The Plessey Company, Limited, Ilford, England

Filed Dec. 9, 1968, Ser. No. 782,239
Claims priority, application Great Britain, Dec. 14, 1967, 56940/67
Int. Cl. G11c 19/00; H03k 23/08
U.S. Cl. 307—221 11 Claims



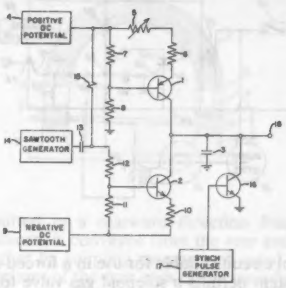
A master/slave switching circuit comprising a master bistable defined by a pair of insulated gate field-effect transistors having associated with them load field-effect transistors and a slave bistable switch defined by a further pair of field-effect transistors also having insulated gate field-effect transistor loads connected there to the master bistable and the slave bistable being interconnected by insulated gate field-effect transistors such that if the state of the master bistable is changed in response to a clock pulse applied to a terminal the state of the slave bistable is also changed, the response of the master bistable to input clock pulses being controlled in accordance with the state of input signals applied to terminals.

3,578,985

PARABOLIC WAVEFORM GENERATING CIRCUIT

Alvin W. Edson, Baldwinsville, N.Y., assignor to General Electric Company

Filed Feb. 3, 1969, Ser. No. 795,859
Int. Cl. G06g 7/12
U.S. Cl. 307—229 5 Claims



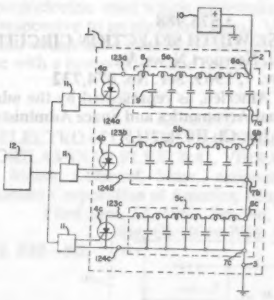
A parabolic generator circuit for generating a smooth parabolic waveform that is stable and free of distortion, and which circuit is of a relatively simple circuit configuration. The circuit includes a constant current source and a sawtooth current source in combination with a capacitor to which is applied current equal to the difference between the fixed and sawtooth currents, the capacitor integrating the applied current so as to generate said parabolic voltage.

3,578,986

STACKED PULSE-FORMING NETWORK SWITCHING CIRCUIT

August L. McGuffin, Clinton, and Ralph M. Philip, Whitesboro, N.Y., assignors to General Electric Company

Filed Aug. 21, 1968, Ser. No. 754,378
Int. Cl. H03k 17/00, 1/00
U.S. Cl. 307—246 8 Claims

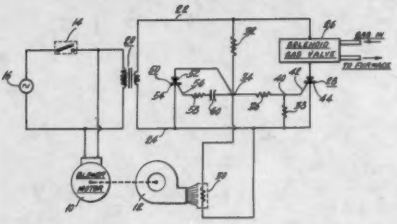


A multiple element switching circuit, including a plurality of controlled unilateral conductive elements such as silicon controlled rectifiers, for connection across a charged pulse-generating circuit and a load in a pulse generator. The switching circuit includes a plurality of SCRs which are each connected in shunt across one of a plurality of serially connected pulse-forming networks. When the SCRs are gated, each pulse-forming network is short circuited. The short-circuited pulse-forming networks provide a step voltage to switch the pulse voltage connected thereacross while providing isolation between each of the conductive elements.

3,578,987
RESISTANCE-SENSING SYSTEM WITH FAIL-SAFE CIRCUIT

Douglas W. De Werth, Cleveland, and Earl J. Weber, Bay Village, Ohio, assignors to Dover Corporation, Louisville, Ky.

Filed Dec. 9, 1968, Ser. No. 782,390
Int. Cl. H03k *17/00*
U.S. Cl. 307—252Q 7 Claims



A control circuit suitable for use in a forced-draft gas-fired heating system permits a solenoid gas valve to be turned on only if a blower is operating. The solenoid of the gas valve is controlled by a silicon-controlled rectifier (SCR) which receives its gate signal from a thermistor circuit. The blower, when operating, blows air over the thermistor to limit the extent to which it heats up in response to current passed through it, thereby maintaining the thermistor resistance high enough to operate the SCR and the gas valve so long as the blower operates properly. If the blower does not operate properly, the thermistor warms up further, its resistance decreases markedly, and the signal which it develops and applies to the gate of the SCR becomes too weak to turn on the SCR and the gas valve. To prevent operation of the gas valve should the thermistor become open-circuited, there is employed a second silicon-controlled rectifier circuit comprising a second SCR having anode and cathode electrodes in shunt with the thermistor and having a gate electrode which derives its voltage from across the thermistor by way of a capacitor having a predetermined minimum value sufficient to cause the second SCR to turn on before the first SCR should the thermistor become open-circuited. When the second SCR is thus turned on, the first SCR cannot be turned on, and the solenoid gas valve is thereby prevented from being turned on if the thermistor becomes open-circuited.

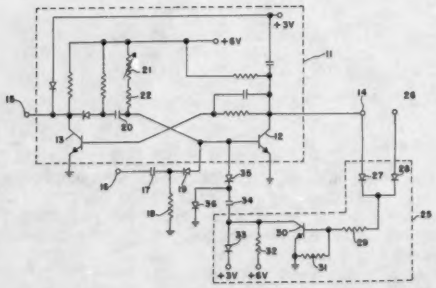
3,578,988
DIGITAL PULSE WIDTH SELECTION CIRCUIT

Daniel F. Slowikowski, Newport News, Va.

Filed Nov. 7, 1969, Ser. No. 874,732

The United States of America, as represented by the administrator of the National Aeronautics and Space Administration

Int. Cl. H03k *1/18*
U.S. Cl. 307—265 5 Claims

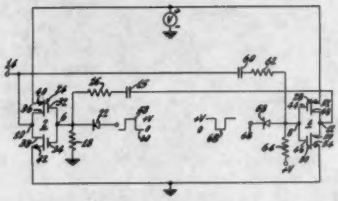


A device that will produce different width pulses. The width of the pulse produced at any given time is selected by a digital input. The digital input selects one of two or more possible timing circuits for a one-shot multivibrator. Hence, the digital input selects one of two or more possible pulse widths capable of being produced by the multivibrator.

3,578,989
PULSE WIDTH STABILIZED MONOSTABLE MULTIVIBRATOR

Robert Charles Heuner, Bound Brook, N.J., assignor to RCA Corporation

Filed June 17, 1969, Ser. No. 834,019
Int. Cl. H03k *3/26*
U.S. Cl. 307—273 7 Claims

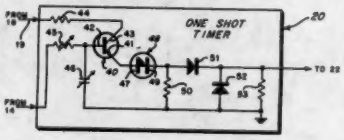


A monostable multivibrator comprising two cross-coupled inverters having substantially identical threshold voltage levels. Each cross-coupled path includes a charge storage means and there is also included a discharge path for each charge storage means. In response to complementary input signals to the inverters, the multivibrator switches from a first state to a second state and, in response to the first of either charge storage means discharging to the threshold voltage level, the multivibrator switches back to its first state.

3,578,990
PULSE GENERATOR TIMING CIRCUITS

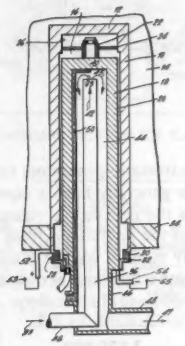
Henry Nauberelt, Brown's Mill, N.J.

Filed Apr. 2, 1969, Ser. No. 812,937
Int. Cl. H03k *17/28*
U.S. Cl. 307—293 5 Claims



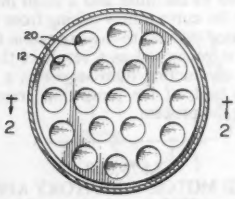
A detector provides a signal for switching on the power supply of a proximately positioned transmitter upon the detection of desired information. A signal representative of the desired information is transmitted and, at predetermined times thereafter, coded signature signals are produced for transmission, these latter signals being supplied by a code generator upon the receipt thereto of pulses from a one-shot and/or repetitive interval timer. The one-shot timer at a predetermined period of time after receipt of the switching signal provides a single pulse to the code generator. The repetitive interval timer provides recurring pulses to the code generator at predetermined intervals of time after receipt of the switching signal. The system consumes no power in the standby mode.

3,578,991
THERMIONIC CONVERTER WITH CONCENTRIC COLLECTOR AND EMITTER
Franz Gross, Neckargemund, and Rudolf Krapf, Leimen, Germany, assignors to Brown, Boveri & Cie A. G., Kallsladter Str., Germany
Filed Sept. 25, 1967, Ser. No. 670,187
Claims priority, application Germany, Sept. 27, 1966, B89094
Int. Cl. H01j 45/00
U.S. Cl. 310—4 2 Claims



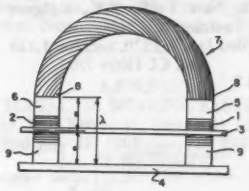
A thermionic converter for converting heat energy directly into electrical energy, the heat being derived from the use in the device of nuclear fuel. In the device the emitter is so disposed as to extend into the mass of nuclear fuel, and has a chamber formed therewithin in which there is disposed the collector electrode element, but spaced from the emitter so as to form a sealed interspace chamber which is filled with a gaseous vapor such as caesium vapor. Electric terminals are provided for carrying outwardly to an electric line the electrical energy from the coupled emitter and collector, and coolant means are provided for conducting coolant fluid into the interior of the collector.

3,578,992
CAVITY EMITTER FOR THERMIONIC CONVERTER
T. O. Paine, Deputy Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Katsunori Shimada, Pasadena, Calif.
Filed Oct. 17, 1968, Ser. No. 768,470
Int. Cl. H01j 45/00
U.S. Cl. 310—4 7 Claims



A thermionic cesium diode incorporating a cavity emitter is disclosed. The emitter defines a plurality of relatively shallow cavities extending inwardly from the surface thereof which faces the interelectrode gap. The depths of the cavities are comparable with the electron-neutral mean-free path and the ratios of the depths of the cavities to their diameters are large enough to neutralize electron space charge from occuring thereat.

3,578,993
VIBRATORY ENERGY GENERATORS
Leslie Tremaine Russell, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Ontario, Canada
Filed Feb. 16, 1970, Ser. No. 11,614
Continuation-in-part of Ser. No. 797,492, Feb. 7, 1969.
Int. Cl. H01v 7/00
U.S. Cl. 310—8.3 4 Claims



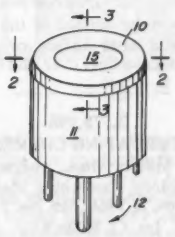
Energy emitted in a rearward direction from vibratory energy transducers is conveyed from the rear end of a transducer to another by coupling members of equal length joining similar portions of the rear ends of the transducers.

In the preferred embodiment the coupling members are of steel rods and are stranded in the form of steel rope without a central crown rod.

3,578,994
PIEZOELECTRIC CLAMPED-FREE BEAM TYPE TRANSDUCER
Frank Massa, Cohasset, Mass., assignor to Massa Division, Dynamics Corporation of America, Hingham, Mass.
Filed Oct. 22, 1969, Ser. No. 868,332
Int. Cl. H01v 7/00
U.S. Cl. 310—8.6 7 Claims

A transducer cartridge carries a miniature video recording head on a tiny vibrating platform. The platform is at the end of a piezoelectric reed which undertakes mechanical excursions responsive to an electrical signal. Various designs are illustrated which have been built and found to be satisfactory for use with a home video tape recorder.

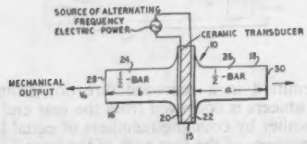
3,578,995
ELECTROACOUSTIC TRANSDUCERS OF THE BILAMINAR FLEXURAL VIBRATING TYPE
Frank Massa, Cohasset, Mass., assignor to Massa Division Dynamics Corporation of America, Hingham, Mass.
Filed Sept. 22, 1969, Ser. No. 859,677
Int. Cl. H01v 7/00
U.S. Cl. 310—8.8 7 Claims



A button transducer comprises a metallic diaphragm concentrically bonded to a piezoelectric ceramic disc. A plurality of types of annular housings are provided for clamping and

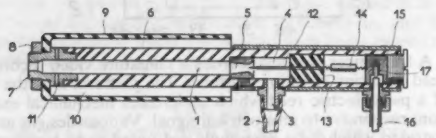
terminating the periphery of the diaphragm, each housing type having a central opening with a different diameter therein. The bonded diaphragm-disc assemblies are measured for resonant frequency, and the housing type is selected to tune the bonded assembly to have a predetermined resonant frequency.

3,578,996
ULTRASONIC MOTOR
Lewis Balamuth, New York, N.Y., assignor to Ultrasonic Systems, Inc., Farmingdale, N.Y.
Filed Jan. 7, 1970, Ser. No. 1,125
Int. Cl. H01v *7/00*
U.S. Cl. 310—8.7 **32 Claims**



An ultrasonic motor having a transducer confined at or near a nodal region of vibration sandwiched between two flanged sections, each flanged section consisting of an elongated member whose average cross section is substantially less than the cross section of the transducer, and the transducer is rigidly coupled to the flanged sections.

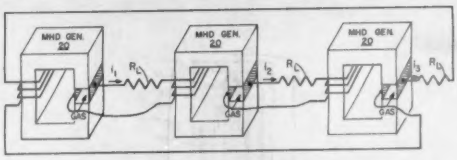
3,578,997
ELECTRIC GENERATORS
Noel Felici, Grenoble, France, assignor to Tunzini-Sames, Grenoble, France
Filed Oct. 15, 1969, Ser. No. 866,689
Claims priority, application France, Oct. 21, 1968, 170,760
Int. Cl. H02n *3/00*
U.S. Cl. 310—10 **9 Claims**



This invention relates to electric generators employing a gaseous fluid, such as air, which is caused to flow through a passage at high speed. The gaseous fluid is ionized by ionizing means comprising a needle electrode and a counter electrode formed by a convergent-divergent wall portion at the upstream end of the passage, the downstream portion of the passage being formed by an electrically insulating tube. According to this invention means are provided to avoid condensation forming on the outer surface of the insulating tube. The anticondensation means may comprise either thermal insulation, around the outer surface of the insulating tube; or means for heating said outer surface, or yet again means inducing a flow of a gaseous fluid over said outer surface.

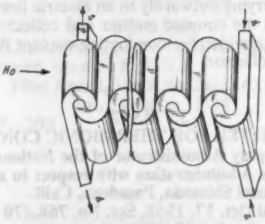
3,578,998
POLYPHASE ALTERNATING CURRENT GENERATOR
William C. Euerle, Milton, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.
Filed Nov. 5, 1968, Ser. No. 773,423
Int. Cl. H02n *4/02*
U.S. Cl. 310—11 **8 Claims**

A polyphase alternating current electrical power generator is obtained by interconnecting N direct current power generators. N is the number of phases to be generated and must be greater than or equal to three. The output of one generator is connected to the input of another generator either serially through a load or in parallel with a load. For rotating or magnetohydrodynamic generators, the output of one generator is connected to the field winding of another generator in a cascaded connection of generators forming a



closed loop. For electrostatic generators the input terminals and output terminals generally have a common ground terminal which restricts the permissible values of N to odd integers. The phasing of the interconnections is such that if the loop is opened at any point, a voltage transfer characteristic corresponding to positive feedback is obtained with a gain of unity and zero phase shift.

3,578,999
MAGNETOHYDRODYNAMIC ENERGY CONVERSION PROCESS
Max Steenbeck, and Fritz Krause, Jena, Germany, assignors to Deutsche Akademie Der Wissenschaften Zu Berlin, Berlin-Adlershof, Germany
Filed July 23, 1969, Ser. No. 843,919
Int. Cl. H02k *45/00;* **H02m** *4/02*
U.S. Cl. 310—11 **10 Claims**

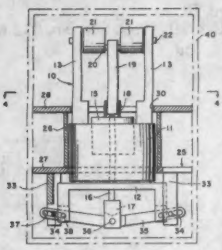


A process for magnetohydrodynamic conversion of mechanical energy in an electrically conducting fluid flowing through a magnetic excitation field. A nonmirror symmetrical flow is applied to the fluid and a main magnetic field is established from the current flow arising from the electromotive force generated parallel to the excitation field. The electromotive force is generated as a result of the alpha-effect. The electrically conducting fluid serves as a conductor for the current flow and, at the same time, removes the heat generated during the process.

3,579,000
SUSPENDED MOTOR VIBRATORY APPARATUS
Joseph W. Mathews, 3762 Swansea Drive, Mobile, Ala.
Filed Nov. 19, 1969, Ser. No. 877,933
Int. Cl. H02k *33/00*
U.S. Cl. 310—15 **8 Claims**

Apparatus for mounting within a case which represents the vibrating load, includes an electric motor assembly and a suspension bracket to which the case is rigidly attached. The motor includes a relatively heavy housing which defines a magnetic stator structure, and a relatively light reciprocating armature structure. The armature oscillates lever arms

pivotally connected to the motor stator; with the lever arms being coupled to the suspension bracket to effect relative



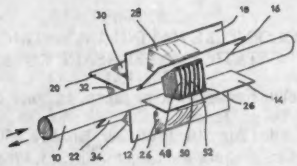
reciprocating movement between the suspension bracket and motor stator.

3,579,001

LINEAR MOTOR HAVING RADIAL ARMATURE PLATES

Yves F. Pelenc, La Tronche, France, assignor to Merlin Gerin, Societe Anonyme, Grenoble, France

Filed Oct. 16, 1969, Ser. No. 866,911
Claims priority, application France, Nov. 7, 1968, 173,022
Int. Cl. H02k *41/02*
U.S. Cl. 310—13 **8 Claims**



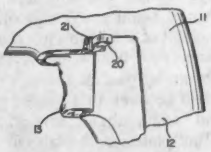
Compact linear motor of high thrust having an annular magnetic field structure with a plurality of radially directed air gaps in which extend armature plates of the motor. The armature plates are subjected to the magnetic flux produced by the field structure resulting in axially directed forces which displace the armature with respect to the field structure.

3,579,002

REVERSING SWITCH FOR POWER TOOLS

John L. Wickham, Glen Arm, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed Mar. 31, 1970, Ser. No. 24,308
Int. Cl. H02k *7/14*; **H01h** *9/06*
U.S. Cl. 310—50 **8 Claims**



A portable power tool including a reversible electric motor, a housing having a handle adapted to be grasped by an operator, and a trigger switch adjacent the handle to be grasped by the operator's finger for energizing the motor. The tool also includes a reversing switch. The operating member for the reversing switch comprises a T-shaped operating lever located above the trigger for convenient engagement by the operator. The base portion of the T-bar is connected through a pivot mounting to the reversing switch whereby rotation thereof through an arc causes operation of the switch. The arm portions of the T-bar extend toward the opposite sides of the tool and protrude slightly through apertures in the housing so that, upon engagement of one or the other by the operator's hand, the reversing switch is moved between its forward and reverse positions.

ERRATA

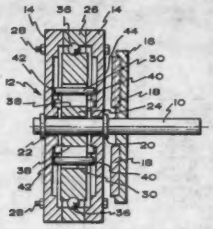
For Classes 310—82, 310—156 see:
Patent Nos. 3,579,276 and 3,579,277

3,579,003

MAGNETIC BRAKING SYSTEM

Robert C. Gray, 280 Clifford St., Blackfoot, Idaho 83221

Filed July 31, 1969, Ser. No. 846,471
Int. Cl. H02k *49/10*
U.S. Cl. 310—93 **10 Claims**



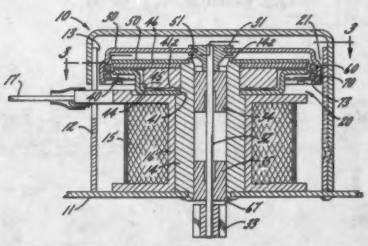
A magnetic braking system for braking the motion of a moving member including first magnet means mounted on the moving member, a support frame positioned proximate the moving member, second magnet means having a polarity opposite the polarity of the first magnet means secured to the support frame, and positioning means for moving the second magnet means on the support frame to a position proximate the first magnet means wherein the magnetic flux between the first and second magnet means brakes the motion of the moving member.

3,579,004

SYNCHRONOUS MOTOR FOR CLOCKS AND THE LIKE

Alan E. Patrick, Statesville, and Kenneth E. Kern, Charlotte, N.C., assignors to General Time Corporation, Stamford, Conn.

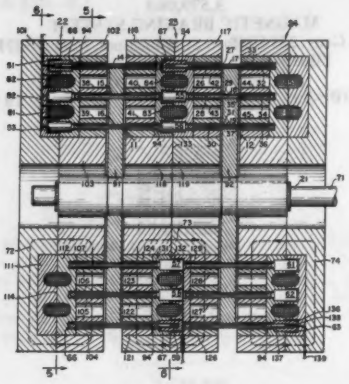
Filed Oct. 16, 1969, Ser. No. 866,970
Int. Cl. H02k *21/00*
U.S. Cl. 310—164 **8 Claims**



A synchronous AC motor for driving clocks or the like having pole structure for producing shaded and unshaded flux in an annular airgap, the airgap being occupied by a rotor having adjacent loops of material of unlike magnetic retentivity, one loop having sufficiently low coercive magnetic intensity to serve, by induction, to start the rotor and bring it up to speed and the second loop having a sufficiently high coercive magnetic intensity as to form durable spots of permanent magnetism for providing torque at synchronous rotor speed. A thick shading ring, to achieve a high shading cur-

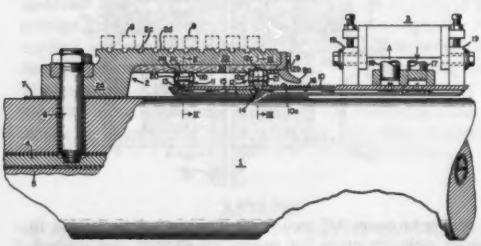
rent, is accommodated by a special pole configuration to achieve compact spacing between the shaded and unshaded poles. The first ring is positioned to be subject to the major flux under starting conditions.

3,579,005
HOMOPOLAR DYNAMOELECTRIC APPARATUS
Bruce P. Noble, 2748 Grande Vista Ave., Oakland, Calif.
Filed July 25, 1969, Ser. No. 844,845
Int. Cl. H02k *31/00*
U.S. Cl. 310—178 **15 Claims**



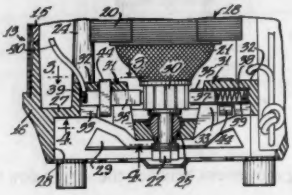
A homopolar dynamoelectric apparatus wherein a field structure is formed with alternately spaced segments of high and low magnetic permeability adjacent a rotating conductive armature for inhibiting undesirable rotation of magnetic flux therewith. The armature is constructed with a plurality of individual sections each adapted to generate a separate voltage potential which may be electrically added to the outputs of each of the other armature sections to produce a resultant output voltage substantially higher than the low output potentials heretofore characteristic of homopolar devices.

3,579,006
LIQUID COOLED COLLECTOR RINGS FOR DYNAMOELECTRIC MACHINE
Fred H. Kindl, Schenectady, and Sterling C. Barton, Scotia, N.Y., assignors to General Electric Company
Filed Nov. 21, 1969, Ser. No. 878,746
Int. Cl. H02k *9/28, 39/00*
U.S. Cl. 310—227 **5 Claims**



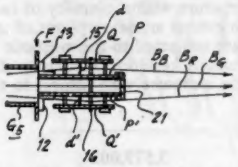
In a dynamoelectric machine of the type having brushes transmitting current to a shaft-mounted collector ring, the improvement consists of a liquid dam on one end of the overhanging ring and means to supply liquid into the rotating cavity and collect liquid from the cavity so as to cool the ring and increase the current-transmitting capacity of the brushes.

3,579,007
COMMUTATOR BRUSH STRUCTURE FOR ELECTRIC MOTOR
John Walter, Evergreen Park, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed Oct. 30, 1969, Ser. No. 872,606
Int. Cl. H02k *5/14*
U.S. Cl. 310—242 **7 Claims**



An electric motor having a supporting frame within which the commutator brushes are supported. The brushes are received in channel-shaped recesses and are retained therein by spring clips which snap into engagement with the supporting frame.

3,579,008
COLOR TUBE HAVING ASYMETRICAL ELECTROSTATIC CONVERGENCE CORRECTION SYSTEM
Senri Miyaoka, Kanagawa-ken, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Apr. 10, 1969, Ser. No. 815,050
Claims priority, application Japan, Apr. 13, 1968, 43/24621
Int. Cl. H01j *3/06, 25/50, 31/20*
U.S. Cl. 313—79 **4 Claims**



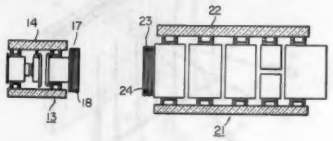
In a single-gun, plural-beam color picture tube in which two beams emerge from a focusing lens along paths that diverge from a central beam emerging along the optical axis of the lens by which all of the beams are focused on the color screen, and the divergent beams are deflected to converge with the central beam by passage through respective electrical fields established between first spaced plates, at opposite sides of the central beam path, and second plates spaced outwardly from the first plates; such plates are disposed closely adjacent to the main deflection yoke by which the beams are made to scan the screen so that the length of the tube can be minimized, and the misconvergence of the beams that may result from the magnetic field produced between the first plates by reason of a current flow induced in the first plates by flux change of the magnetic field of the main deflection yoke is corrected by providing the second plates with different dimensional relationships to the first plates, for example, different distances from the first plates or different distances along the first plates, so that the deflecting effects of the electrical fields are correspondingly different.

3,579,009

ELECTRON GUN ASSEMBLY INCLUDING TWO PART THREADED ELECTRODE

Tsutomu Nishino; Kokiti Kinoshita, and Haruo Maeda, Kadoma, Osaka, Japan, assignors to Matsushita Electric Industrial Company Limited, Kadoma, Osaka, Japan

Filed July 3, 1969, Ser. No. 839,015
Claims priority, application Japan, July 10, 1968, 43-49268
Int. Cl. H01j 29/46, 1/00, 8/50
U.S. Cl. 313—83 1 Claim



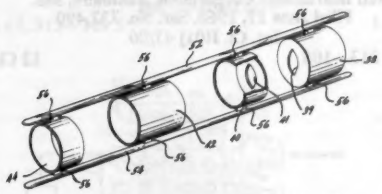
An electron gun assembly for a cathode-ray tube having a removable cathode-grid assembly which has a plurality of stem leads connected with the respective electrodes and led out to the outside at the stem and which is supported by multihold glass bars, and an anode and focusing electrode assembly which has a plurality of side leads connected with the respective electrodes and led to the outside from the side and which is supported by multihold glass bars.

3,579,010

ELONGATED APERTURE ELECTRON GUN STRUCTURE FOR FLAT CATHODE RAY TUBE

Robert C. Jones, Elkins Park, Pa., assignor to Philco-Ford Corporation, Philadelphia, Pa.

Filed Oct. 31, 1968, Ser. No. 772,232
Int. Cl. H01j 1/46, 29/46
U.S. Cl. 313—86 9 Claims



An electron gun for a flat cathode-ray tube wherein the control electrode and the screen electrode of the gun each have an elliptical aperture therein, and a flat cathode-ray tube employing such a gun. The major axes of the two elliptical apertures lie in a common plane which is oriented with respect to the faceplate of the tube so that an electron beam emitted by the cathode of the gun produces a substantially circular spot on said faceplate.

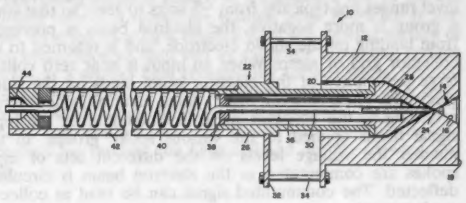
3,579,011

LIQUID METAL CATHODE WITH SINGLE CAPILLARY FLOW IMPEDANCE

Julius Hyman, Jr., Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 8, 1969, Ser. No. 789,768
Int. Cl. H01j 1/06, 1/10, 13/10
U.S. Cl. 313—29 6 Claims

The liquid metal cathode is employed as a cathodic electron source in arc discharges. A small liquid metal pool serves as the arcing material, and when it is kept small, improved electron-to-atom emission ratios are obtained, as well as gravity independence. However, when such a small pool is employed, feed to the pool must be free of feed rate perturbations. Otherwise, an instability in the level of the mercury in the pool results. The present invention obtains feed rate stability by providing a feed passage with a diameter which is everywhere larger than that of the feed channel which finally discharges to the pool. Feed flow impedance is provided by an elongated capillary feed channel.

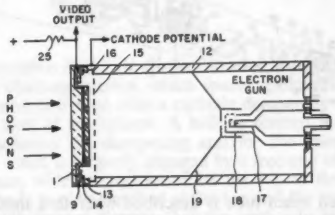


3,579,012

IMAGING DEVICE WITH COMBINED THIN MONOCRYSTALLINE SEMICONDUCTIVE TARGET-WINDOW ASSEMBLY

Walter K. Zwicker, Scarborough, N.Y., and Alfred Milch, Teaneck, N.J., assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 16, 1968, Ser. No. 767,958
Int. Cl. H01j 31/26; H011 3/12
U.S. Cl. 313—65 10 Claims



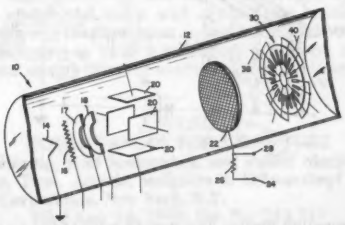
An imaging device, especially a vidicon-type camera tube, in which the active target layer is an ultrathin monocrystalline semiconductor grown epitaxially on a thicker supporting monocrystalline substrate which is transparent to the imaging radiation and thus serves as a window for the radiation to enter the tube to be detected by the semiconductor.

3,579,013

CATHODE RAY TUBE HAVING RADIALLY DIRECTED COMMUTATOR ELEMENTS

Elvin E. Herman, Pacific Palisades, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 8, 1969, Ser. No. 789,731
Int. Cl. H01j 31/06, 29/78
U.S. Cl. 313—73 2 Claims



A focused electron beam is circularly deflected. It is directed at a commutator target and passes through a positive collector mesh. The target comprises a plurality of separate, conductive spokes. Alternate spokes are connected together and serve as a shield electrode, which is held slightly

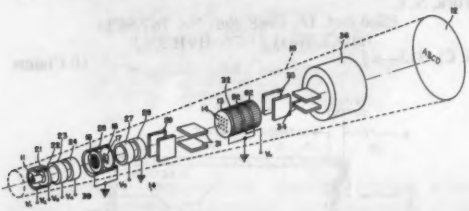
positive with respect to the cathode. The remaining alternating spokes are grouped with three to five of the spokes being connected together to form an input channel. Input channel level ranges are typically from −5 volts to zero, so that when a group is more negative, the electron beam is prevented from landing on the shield electrode, and is returned to the collector grid or mesh. When an input is near zero volts, a large percentage of the electron beam lands on the shield electrode. Thus, between these values, electron beam current returning to the collector mesh is modulated by the input signal levels applied to the various spoke groups. In this manner the voltage levels on the different sets of input spokes are commutated as the electron beam is circularly deflected. The commutated signal can be read as collector mesh current.

3,579,014

SHAPED BEAM TUBE HAVING FINE MESH CLOSELY ADJACENT SUBSTANTIALLY RECTANGULAR TRIM APERTURE

Charles R. Corpew, La Mesa, Calif., assignor to Stromberg Datagraphics Inc., San Diego, Calif.

Filed Aug. 19, 1968, Ser. No. 753,601
Int. Cl. H01j *29/56, 29/70, 29/06*
U.S. Cl. 313—86 **5 Claims**



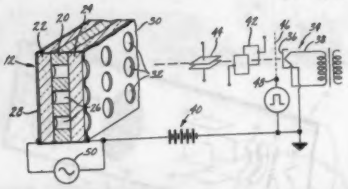
A shaped beam tube is described wherein a mesh is provided adjacent a trim aperture to diffuse the beam (which is utilized to flood the shaping aperture) and to produce a substantially uniform intensity over the cross section of the beam.

3,579,015

ELECTRON BEAM ADDRESSED PLASMA DISPLAY PANEL

Robert O. Gregory, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 18, 1969, Ser. No. 808,195
Int. Cl. H01j *29/10;* **H05b** *33/02*
U.S. Cl. 313—89 **8 Claims**



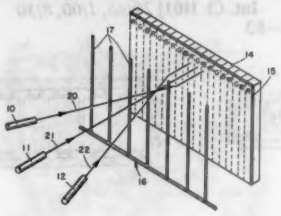
A combination display and storage tube of the type having gas-filled cells sandwiched between flat insulating sheets. One of the two electrodes for applying the sustaining voltage to the gas-filled cells is provided with apertures so that an electron beam may be used to initiate or extinguish the discharge of selected cells.

3,579,016

POSTDEFLECTION TUBE WITH ALL RARE EARTH PHOSPHORS

Frank C. Palilla, Maspeth, N.Y., assignor to General Telephone & Electronics Laboratories Incorporated

Filed Oct. 23, 1967, Ser. No. 677,198
Int. Cl. H01j *29/32, 31/20*
U.S. Cl. 313—92 **2 Claims**



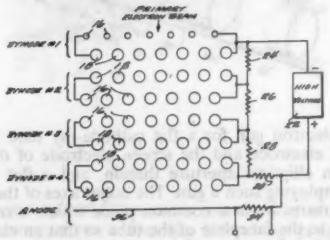
A color cathode-ray tube of the postdeflection-focusing type (PDF) wherein the phosphor screen exhibits a linear change in brightness with changes in electron beam current density over the entire operating range of the tube. The preferred phosphor screen employs trivalent europium activated yttrium vanadate as the red-emitting phosphor, trivalent terbium activated yttrium phosphate as the green-emitting phosphor and divalent europium activated strontium chlorophosphate as the blue-emitting phosphor. The disclosed screen results in a PDF tube which exhibits a linear increase in brightness, improved contrast and maintenance of color balance for all values of beam current.

3,579,017

HARP ELECTRON MULTIPLIER

Marvin L. Vestal, Baltimore, Md., assignor to Scientific Research Instruments Corporation, Baltimore, Md.

Filed June 17, 1968, Ser. No. 737,490
Int. Cl. H01j *43/00*
U.S. Cl. 313—105 **12 Claims**

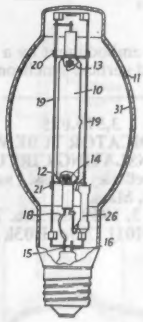


An electron multiplier having a plurality of dynodes wherein each dynode includes two wire layers located in staggered relationship with one another and wherein each of the dynodes is located with a first one of its wire layers aligned with the immediately adjacent wire layer of an immediately preceding dynode and with its second wire layer aligned with the immediately adjacent wire layer of an immediately following dynode. The wires in each layer of each of the dynodes are spaced so that the open space between them is less than the diameter of the wires, with the exception of the first wire layer in the first dynode wherein the wires may be of a noncircular cross section or of a smaller diameter and wherein they are spaced apart by a distance greater than the diameters thereof.

3,579,018
LUMINESCENT MATERIALS

Peter Whitten Ranby, and David Richard Palowkar, London, England, assignors to British Lighting Industries Limited, London, England

Filed Apr. 18, 1969, Ser. No. 817,367
Claims priority, application Great Britain, Apr. 30, 1968, 20,505/68
Int. Cl. H01j 63/04
U.S. Cl. 313—109 4 Claims

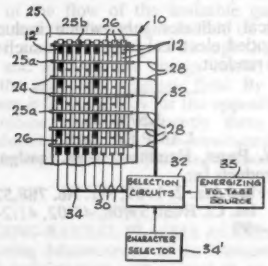


New phosphors, emitting a red fluorescence and suitable for use in high-pressure mercury vapor lamps, consist of zinc aluminate activated by chromium in which some of the alumina is replaced by boron oxide.

3,579,019
LIGHT CELL MATRIX STRUCTURE

Alfred D. Scarbrough, Northridge, Calif., assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.

Filed Apr. 1, 1969, Ser. No. 812,256
Int. Cl. H01j 5/16
U.S. Cl. 313—109.5 13 Claims

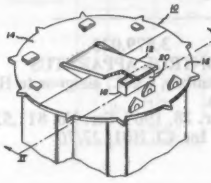


A light cell structure for supporting and conducting energizing signals to a rectangular matrix of ionizable gas-filled light cells. The structure is constructed and arranged so as to permit the emitted light from an energized cell to be directly viewed without first passing through an electrode. Each light cell is typically of the general shape of a rectangular parallelopiped. One pair of opposed surfaces of each parallelopiped light cell serve as energizing surfaces, and one of the remaining surfaces is a light transmitting surface which serves as a viewing surface. The light cells are supported and selectively energized by a row-column arrangement of conductive members to which the light cells are affixed by their energizing surfaces. The row conductive members are typically conductive strips, while the column conductive members are typically conductive strips having uniformly spaced upstanding tabs provided along the length thereof. Each light cell has one of its energizing surfaces affixed to a respective row strip at a respective one of a plurality of uniformly spaced positions along the length of the row, and the other of its energizing surfaces affixed to a respective one of the upstanding tabs of a respective column strip. Provision is also made for enhancing light emitted from the viewing surface of each parallelopiped light cell by using the remaining surface thereof as a second light transmitting surface whose emitted light passes through a respective appropriately located aperture provided in the column strip to reflective means which reflects light emitted from this second light transmitting surface back up through the light cell and out the viewing surface.

3,579,020
ELECTRON DISCHARGE DEVICE WITH ELECTRODE SPACER HAVING INTEGRAL ELECTRON VIBRATION DAMPENING MEMBER THEREON

William F. Cullen, Philpot, Ky., and Othmar E. Ringeman, St. Meinrad, Ind., assignors to General Electric Company

Filed Dec. 13, 1968, Ser. No. 783,543
Int. Cl. H01j 1/18, 19/12
U.S. Cl. 313—269 4 Claims

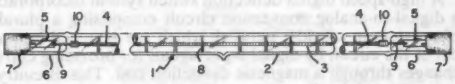


An insulative electrode spacer member is provided for an electron discharge device, which spacer comprises a disc of natural mica provided with a cathode dampening arm as an integral part of the spacer. A hole is formed in the mica spacer adjacent the dampening arm for the insertion of a cathode which is properly engaged by a free end of the dampening arm which is positioned on the top of the cathode. The cathode may be notched at the top and the arm so positioned with respect thereto that the arm only engages the bottom of the notch when the cathode expands due to normal operational heating.

3,579,021
INCANDESCENT LAMP HAVING LINEAR OUTPUT

Stephen F. Kimball, Beverly, Mass., assignor to Sylvania Electric Products, Inc.

Filed Apr. 30, 1969, Ser. No. 820,369
Int. Cl. H01j 1/96, 19/52
U.S. Cl. 313—274 5 Claims



The coiled filament of an elongated tubular incandescent lamp is axially mounted and supported therein by spacers bearing against the inside wall of the lamp envelope. The space between filament turns is less at its ends than at its center in order to yield a substantially uniform output of radiational energy from the entire length of the lamp.

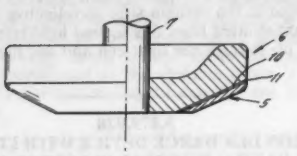
3,579,022
ROTARY ANODE FOR X-RAY TUBE

Walter Hennig; Karl Sedlatschek, and Rudolf Machenschalk, Reutte, Tirol, Austria, assignors to Schwarzkopf Development Corporation, New York, N.Y.

Filed Aug. 16, 1968, Ser. No. 753,210
Claims priority, application Austria, Aug. 28, 1967, A7870/67
Int. Cl. H01j 35/10, 35/26
U.S. Cl. 313—330 2 Claims

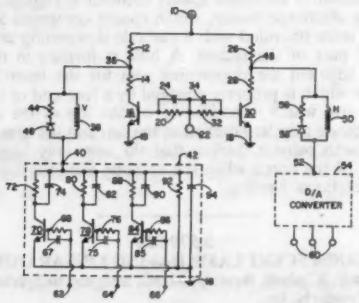
A rotary anode for an X-ray tube, the anode body consisting essentially of graphite, and having a target layer bonded

thereto consisting essentially of a tungsten-rhenium alloy; in an alternate embodiment, to improve the bonding between the target layer and the anode body, a thin stratum consisting essentially of rhenium is interposed between the anode body and the tungsten-rhenium target layer;



and processes of uniting the target layer to the anode body, including depositing the tungsten and rhenium layer on the anode body out of a gas phase, and depositing the intermediate rhenium layer between the target layer and the anode body out of a gas phase.

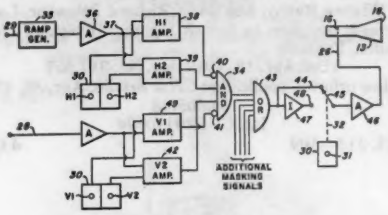
3,579,023
CONTROL APPARATUS
Morton H. Fox, Alhambra, Calif., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Mar. 28, 1969, Ser. No. 811,523
Int. Cl. H01j *27/70*
U.S. Cl. 315—18 **7 Claims**



A high-speed digital deflection switch system incorporating a digital-to-analog conversion circuit comprising a plurality of resistors in a ladder network which are switched into and out of the circuit by digital input signals for providing current changes through a magnetic deflection coil. This circuitry is accompanied by linearizing capacitors to produce a more constant deflection rate and further includes a circuit for changing the character size from large to small letters.

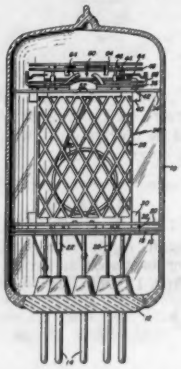
3,579,024
SELECTIVE BLANKING CONTROL CIRCUIT
David A. Sokolov, Fairport, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Division of Ser. No. 700,317, Jan. 2, 1968, Pat. No. 3,459,888, which is a continuation-in-part of application Ser. No. 532,289, Mar. 7, 1966. Filed Feb. 3, 1969, Ser. No. 823,211
Int. Cl. H01j *29/52*
U.S. Cl. 315—22 **6 Claims**

Apparatus for selectively masking graphic material to be recorded on photographic film wherein masking is performed by using a cathode ray tube (CRT) to generate and position a light pattern over an area of the graphic material to be masked thereby overexposing the film in the area of the light pattern when the graphic material is imaged onto the film and wherein a light pattern is formed by selectively blanking the CRT electron beam in one embodiment by a circuit operating on the CRT horizontal and vertical deflection



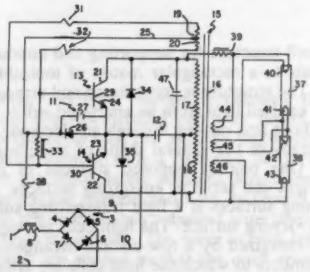
signals and in another embodiment by a circuit operating on the CRT horizontal and vertical synchronization pulses.

3,579,025
NUMERICAL INDICATOR TUBE WITH BUILT-IN TRANSLATING CIRCUIT
Harold J. Rayner, Wellesley, Mass., assignor to Raytheon Company, Lexington, Mass.
Filed Feb. 3, 1969, Ser. No. 795,856
Int. Cl. H01j *17/34*; **H03k** *23/38*
U.S. Cl. 315—84.6 **3 Claims**



A numerical indicator tube which includes means for translating coded electrical information such as binary data into decimal readout.

3,579,026
LAMP BALLAST
Frederick W. Paget, Hamilton, Mass., assignor to Sylvania Electric Products Inc.
Filed Jan. 2, 1969, Ser. No. 788,524
Int. Cl. H05b *39/00, 41/02, 41/24*
U.S. Cl. 315—99 **5 Claims**

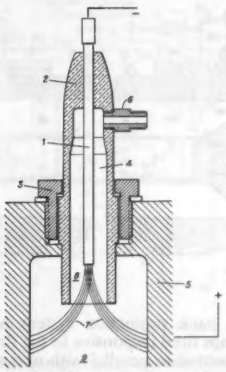


A solid-state ballast for an electric discharge lamp, the ballast including an unfiltered full-wave rectifier, a transistor inverter for increasing the frequency and a transformer for coupling the lamp.

3,579,027
IGNITING AID FOR HIGH EFFICIENCY PLASMA PRODUCERS

Maximilian Pater, Vienna, Austria, assignor to Gebr. Bohler & Co. Aktiengesellschaft, Vienna, Austria

Filed Mar. 4, 1968, Ser. No. 710,175
Claims priority, application Austria, Mar. 3, 1967, A2031/67
Int. Cl. H01j 7/30
U.S. Cl. 315—111 7 Claims

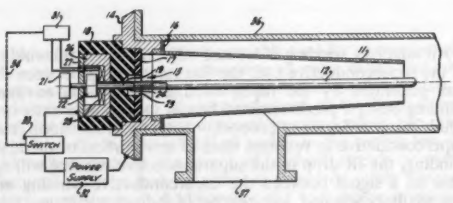


An ignition device for high efficiency plasma producers, which device precludes the necessity for extremely high voltages to produce the initial ignition of the plasma producer by providing high specific ionic densities between the electrodes thereof. The ignition device consists of an annular passage surrounding a rod electrode and through which ionizable gas is passed. The cylindrical wall which defines the outer periphery of the annulus continues axially beyond the end of the rod electrode to form a first tubular passage. A further cylindrical wall forms a second larger diametered tubular passage beyond said first tubular passage. An arc is struck between the rod electrode and the cylindrical wall forming the second tubular passage, which arc has electric lines of force in the form of a cone with the apex pointing upstream the direction of the flow of the ionizable gas. The cone-shaped arc has an azimuthal magnetic field on the inside and outside thereof, and as the gas goes through the arc it is partially ionized and the opposite charge carriers are radially separated by the azimuthal magnetic field. By virtue of the separation, there is less tendency for the opposite charge carriers to recombine, and consequently there is a higher specific ionic density when the gas is introduced between the electrodes of the high efficiency plasma producer.

3,579,028
CONVERGING-BARREL PLASMA ACCELERATOR

T. O. Paine, Acting Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Dah Yu Cheng, Menlo Park, Calif.

Filed Oct. 23, 1968, Ser. No. 769,998
Int. Cl. H01j 1/50, 7/24; H05b 1/00
U.S. Cl. 315—111 7 Claims

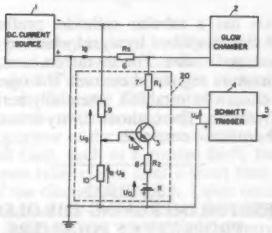


The invention comprises a device for generating and accelerating plasma to extremely high velocity, while focusing the plasma to a decreasing cross section for attaining a very dense high-velocity plasma burst capable of causing nuclear fusion reactions. A converging coaxial accelerator-electrode configuration is employed with "high-pressure" gas injection in controlled amounts to achieve acceleration by deflagration and focusing by the shaped electromagnetic fields.

3,579,029
MONITORING CIRCUIT FOR A HIGH-INTENSITY GLOW DISCHARGE FOR METALLURGICAL PROCESSES

Gelli Spescha, Winterthur Zurick, Switzerland, assignor to Elektrophysikalische Anstalt Bernhard Berghaus, Vaduz, Liechtenstein

Filed Oct. 24, 1967, Ser. No. 677,660
Claims priority, application Germany, Nov. 9, 1966, J32191
Int. Cl. H02h 7/00
U.S. Cl. 315—127 2 Claims

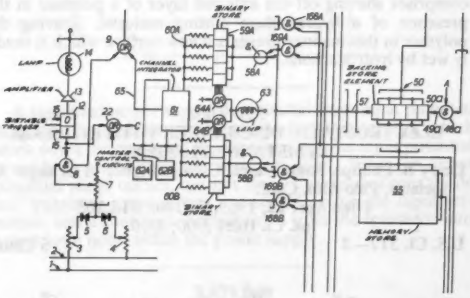


Monitoring circuit for a glow discharge wherein the voltage and current of the discharge are compared by the circuit and a Schmitt trigger generates a control signal if the voltage-current relationship indicates unsafe operation.

3,579,030
STAGE LIGHTING CONTROL UNIT

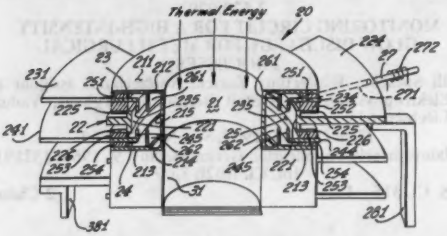
Frederick Percy Bentham, Ealing, London; Phillip Robert Sheridan, Bickley, Kent; Joseph Trevor Foreman, Wembley Park, and Ian William Stimpson, Windsor, England, assignors to The Strand Electric & Engineering Company Limited, London, England

Filed May 2, 1968, Ser. No. 726,001
Claims priority, application Great Britain, May 3, 1967, 20,462/67
Int. Cl. H05b 37/00
U.S. Cl. 315—291 12 Claims



A stage lighting control unit in which dimmer line signals are recorded in a memory unit for subsequent recall, and in which an active memory connected between the dimmer lines and the memory store includes a backing store for reading information into and out of the memory unit and also includes a pair of individual active memory elements into which information can be written from the backing store for transmission to the dimmer lines.

3,579,031
ZERO ARC DROP THYRATRON
William J. Kearns, Arcadia, Calif., assignor to Xerox Corporation
Filed June 7, 1967, Ser. No. 644,146
Int. Cl. H01j 17/08, 17/20
U.S. Cl. 315—363 18 Claims

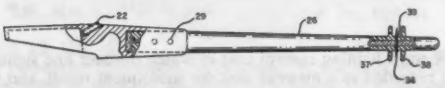


A thyratron has a tubular cathode, preferably made of rhenium and circumscribed by a grid which in turn is circumscribed by an anode tube. The thyratron cavity is filled, e.g., with vapor pressure regulated cesium. The operating parameters can be chosen to establish essentially zero voltage drop across the thyratron. The cathode cavity is contiguous with a cavity of a thermionic converter.

3,579,032
PROCESS FOR IMPROVING THE OLEOPHILIC PROPERTY OF POLYMERS
Robert B. Jacobs, Homewood, Ill., assignor to Standard Oil Company, Chicago, Ill.
Filed Aug. 13, 1968, Ser. No. 752,277
Int. Cl. H05f 3/06
U.S. Cl. 317—2 4 Claims

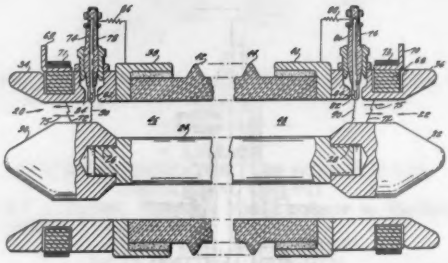
This invention concerns a process for improving the oleophilic property of polymers, particularly polyethylene, and comprises shaving off the external layer of a polymer in the presence of a hydrocarbon cutting material. Shaving the polymer in this manner presents a new surface which is readily wet by hydrocarbons.

3,579,033
ELECTROSTATIC DISCHARGER WITH INTERNAL RESISTANCE ELEMENT
Larry B. Phillips, Santa Clara, Calif., assignor to Granger Associates, Palo Alto, Calif.
Filed Apr. 22, 1969, Ser. No. 818,265
Int. Cl. H05f 1/00, 3/00
U.S. Cl. 317—2 6 Claims



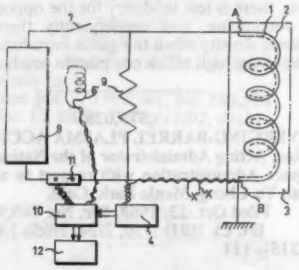
A discharger for reducing electrostatic discharge interference on objects such as aircraft having an elongated insulating body with an internal resistive element connecting the object to a conductive discharge element at the end of the body via the resistive element.

3,579,034
COMPRESSED GAS SYSTEM FOR ARC EXTINCTION
Otto Jensen, Malvern, Pa., assignor to I-T-E Imperial Corporation
Division of Ser. No. 568,942, July 29, 1966, Pat. No. 3,452,251. Filed Feb. 7, 1969, Ser. No. 817,208
Int. Cl. H02h 3/00, 9/06, 7/24
U.S. Cl. 317—11 14 Claims



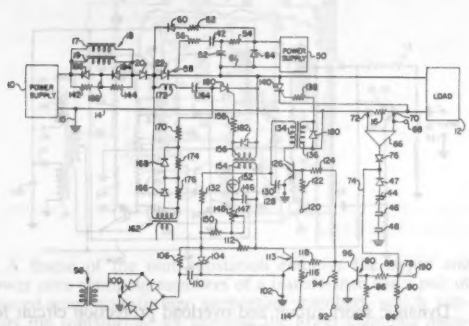
A capacitor bank protection system having series-connected spark gaps fired responsive to the firing of a precision spark gap connected in parallel with one of the series gaps. Each pair of spark gaps is disposed at the outer end of a central elongated electrode surrounded by cooperating ring-shaped electrodes at the outer ends of the central electrode. An air blast is introduced into the annular space between the central electrode and outer cooperating electrodes for extinguishing the arc.

3,579,035
SYSTEM FOR DETECTION OF TRANSITION BETWEEN SUPERCONDUCTIVE AND RESISTANT STATE IN SUPERCONDUCTIVE COILS
Pierre Burnier, Thairy, and Jack Moreau, Orsay, France, assignors to Societe Generale de Constructions Electriques et Mecaniques (Alsthom), Paris, France
Filed Sept. 27, 1968, Ser. No. 763,251
Int. Cl. H01h 3/28
U.S. Cl. 317—13 5 Claims



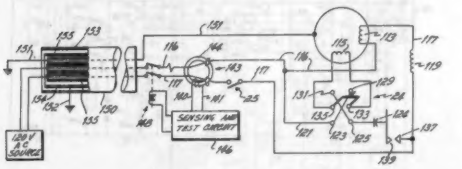
An auxiliary winding is located adjacent the main winding of the superconductive coil, the flux relationship between the flux generated by the main winding and by the auxiliary winding being a predetermined factor, for example unity or a whole number factor of proportionality; upon transition from superconductive to resistant state of any portion of the main winding, the IR drop in the superconductive winding will appear as a signal between the superconductive winding and the auxiliary winding, irrespective of inductive voltages. This signal is compared with a voltage drop across a resistance in the supply of the main winding to obtain an alarm which can be used to disconnect the superconductive coil from a supply.

3,579,036
CROWBAR CIRCUIT FOR VOLTAGE CUTOFF WITH SERIES AND SHUNT SWITCHABLE MEANS
Marion B. McCoy, Centerville, Ohio, assignor to The National Cash Register Company, Dayton, Ohio
Filed Jan. 24, 1969, Ser. No. 793,677
Int. Cl. H02h *3/00, 7/00, 5/00*
U.S. Cl. 317—16 14 Claims



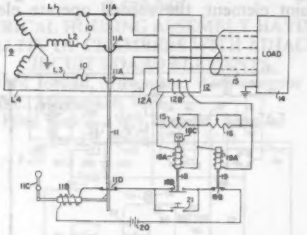
A crowbar circuit comprises means sensitive to an overcurrent condition through a load to promptly throw a crowbar across the load, thereby isolating the load from its power supply. To prevent an unreasonable dissipation of power through the crowbar, the same sensing mechanism which throws the crowbar initiates operation of a time delayed mechanism which disconnects the power supply from the crowbar. To further conserve the power supply during the interval following operation of the crowbar and before disconnection of the power supply, the circuit includes energy absorbing means which retards dissipation of power from the power supply.

3,579,037
PORTABLE TOOL
Donald J. Hackman; Ronald L. Legue, Columbus; Jeremy M. Harris, and Donald E. Roop, Worthington, Ohio, assignors to Oceanautic Manufacturing and Research Company, Cincinnati, Ohio
Continuation-in-part of application Ser. No. 754,783, Aug. 23, 1968. This application Nov. 12, 1968, Ser. No. 774,622
Int. Cl. H02h *3/28, 7/26*
U.S. Cl. 317—18 29 Claims



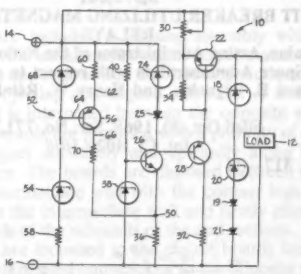
An electric motor-driven portable tool for use underwater. The tool and motor are insensitive to water depth and corrosion because of the tool design and choice of materials. To minimize the danger of electrical shock to the human operator, the tool is used in combination with a safety trip circuit which is effective to cut off all power to the tool in less than 30 milliseconds in the event of a short circuit or even a minimal current leak in either the tool or cable supplying current to the tool. Additionally, the tool motor is insulated from the housing, the tool housing is grounded by a third ground or neutral wire in the power cable and the cable has a metal sheath which is also grounded at or near the power source.

3,579,038
ELECTRICAL FAULT PROTECTION SYSTEM
Robert P. Backderf, Franklin, and Douglas R. Kanitz, Middletown, Ohio, assignors to Square D Company, Park Ridge, Ill.
Filed Aug. 14, 1969, Ser. No. 850,212
Int. Cl. H02h *3/28, 7/26*
U.S. Cl. 317—18 7 Claims



A normally open relay and a normally closed relay responsive to fault currents in an electrical distribution system control the opening of a disconnect switch incapable of interrupting large fault currents. The contacts of the relays are connected in series in an energizing circuit for an electroresponsive operator of the disconnect switch. Upon occurrence of a small fault, such as a ground fault, the contact of the normally open relay closes after a short time delay to effect opening of the disconnect switch. Upon occurrence of a large fault, the contact of the normally open relay also closes as for a small fault, but the contact of the normally closed relay opens instantaneously to prevent opening of the disconnect switch.

3,579,039
SURGE PROTECTION CIRCUIT
Ivan R. Damon, Tinley Park, Ill., assignor to SCM Corporation, New York, N.Y.
Filed Feb. 17, 1969, Ser. No. 799,678
Int. Cl. H02h *3/22*
U.S. Cl. 317—22 16 Claims

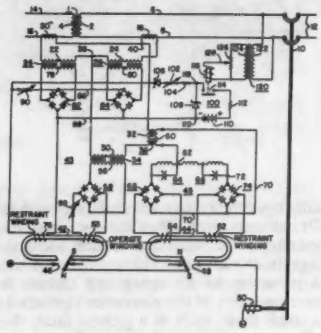


A regulated power supply is protected from input potential surges by a transistor and Zener diode input network which shuts down the regulated supply whenever the input potential exceeds a predetermined maximum level. When an input potential surge occurs, current flows through a Zener diode and transistor series circuit connected across the input terminals, and a shutdown current flows from the transistor into a shutdown node within the power supply.

3,579,040
DESENSITIZING CIRCUIT FOR A DIFFERENTIAL RELAY
Nathaniel D. Tenenbaum, Plainfield, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Feb. 18, 1969, Ser. No. 800,109
Int. Cl. H02h *3/28*
U.S. Cl. 317—27 17 Claims

A differential type protective relaying apparatus for a power-transforming device; the relaying apparatus having

first and second switches controlled by first and second operate elements and first and second restraint elements; said first operate element being energized as a function of the difference between the input and output energy of the transferring device and said first restraint element being energized as a function of the amount of energy passed through the transferring device and there is provided a second circuit, energized as a consequence of an overvoltage applied to the transferring device to supply additional energization to the first restraint element; the second operate element being



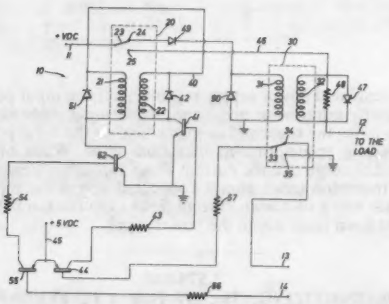
energized as a function of the magnitude of the fundamental frequency portion of the difference between the input and output energy to and from the transferring device; and the second restraint element being energized as a function of the magnitude of the second harmonic frequency portion of the difference between the input and output energy to and from the transferring device. The relaying apparatus being effective to disconnect the power-transferring device when one or the other of the first or the second operate element overcomes its associated restraint element.

3,579,041

CIRCUIT BREAKER UTILIZING MAGNETIC LATCHING RELAYS

T. O. Paine, Acting Administrator of the National Aeronautics and Space Administration with respect to an invention of; Williard E. Reynolds, and Henry W. Reinhold, Plymouth, Mich.

Filed Oct. 30, 1968, Ser. No. 771,759
Int. Cl. H02h *3/08*
U.S. Cl. 317—33 **3 Claims**



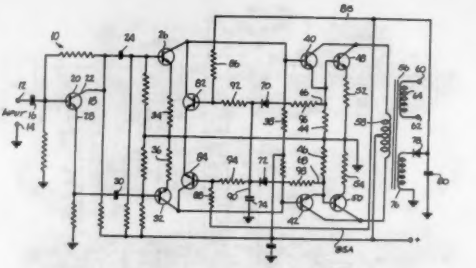
In circuit breakers wherein power consumption is significant, a circuit breaker relay being operably controlled by switching transistors normally biased off, the operation of which is triggered by a magnetic latching relay having a coil sensitive to current flow and requiring current flow only on switching.

3,579,042

PROTECTION CIRCUIT WITH SIMULTANEOUS VOLTAGE AND CURRENT SENSING MEANS

Irving J. Abend, Bergenfield, N.J., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Dec. 23, 1968, Ser. No. 786,027
Int. Cl. H02h *7/00*
U.S. Cl. 317—33 **17 Claims**



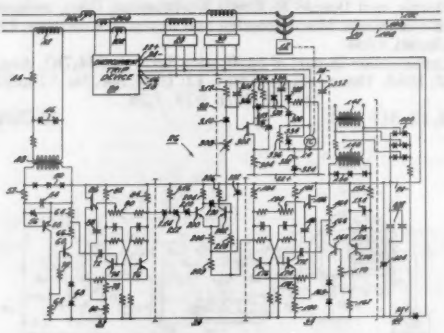
Dynamic short circuit and overload protection circuit for transistorized power amplifiers; the circuit is noninstantaneous in operation and comprises means for sensing current through and voltage across a transistor to be protected, means for combining, and integrating with respect to time, signals related to the sensed voltage and current to provide a control signal, and means for shunting the input to the transistor when the control signal reaches a predetermined value.

3,579,043

REVERSE POWER RELAY

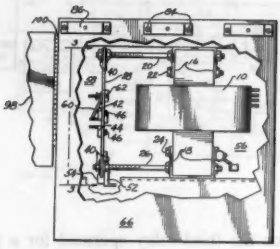
Charles P. Goeller, Quincy, Mass., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Nov. 15, 1968, Ser. No. 776,127
Int. Cl. H02h *3/38*
U.S. Cl. 317—36 **2 Claims**



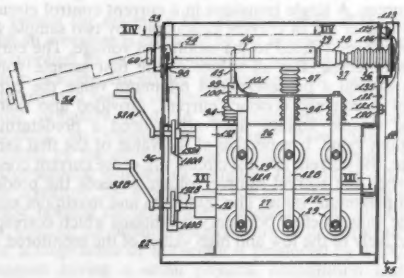
A reverse power relay using semiconductor components is provided to sense the phase relationship between current and voltage in an electric circuit and to trip a circuit breaker controlling that circuit in the event of reverse power conditions. The reverse power relay comprises an amplifier and current multivibrator circuit, an amplifier and potential multivibrator circuit, a comparator circuit, and a timing and output circuit. Current and voltage condition signals from the two multivibrator circuit are compared in the comparator circuit and, if a reverse power condition exists, an output signal from the timing and output circuit operates a trip coil which trips the circuit breaker. The reverse power relay is powered from the same power supply as a known type of overcurrent trip device.

3,579,044
UNIT SUBSTATION WITH TRANSFORMER AND CONTROL COMPARTMENTS
Lawrence Phillips, Jr., 840 Inverness, Pasadena, Calif. 91103
Filed Nov. 13, 1969, Ser. No. 876,465
Int. Cl. H01f 27/06, 27/04
U.S. Cl. 317—103 10 Claims



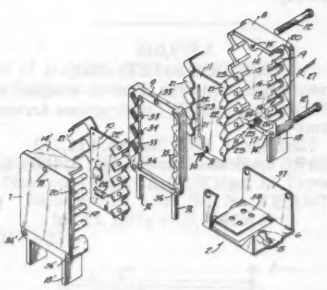
A frame of the unit substation employs the upper and lower core clamping members of a transformer and a pair of spaced-apart transformer supporting members which support the transformer by carrying the lower clamping members. A barrier of insulating material is mounted within a housing through the bolts used to exert the clamping force of the core clamping members on the core of the transformer. Output terminals from the secondary side of the transformer are connected directly to corresponding horizontally disposed bus bars. The barrier mounts the bus bars and separates the interior of the housing into a transformer compartment and a controller compartment. The substation is constructed such that air can freely circulate through not only the transformer compartment but also the control compartment.

3,579,045
HIGH VOLTAGE AIR TERMINAL CHAMBER FOR INDOOR POWER CENTER WITH INTERLOCKS BETWEEN FUSE DRAWERS AND CIRCUIT BREAKERS, FUSE CLAMPING AND LATCHING MEANS, AND UNIVERSALLY PIVOTAL TERMINAL MEANS
Thomas H. Keogh, Pittsburgh, and Adolph E. Krupit, Allison Park, Pa., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.
Filed Oct. 18, 1968, Ser. No. 768,811
Int. Cl. H01h 9/20; H02b 1/18
U.S. Cl. 317—114 55 Claims



An indoor unit substation for supplying electrical power at distribution voltage includes an electrical transformer and an air terminal chamber enclosing terminating means for tap cables from a plurality of high-voltage primary feeder sources, a circuit interrupter for each source, and high-voltage fuses between the circuit interrupters and the transformer supported on horizontal drawout drawers in alignment with horizontal insulating bushings on the transformer. Manual fuse clamping means push the fuses into high-pressure contact with universal motion terminals on the transformer-insulating bushings, latching means are provided for the fuse drawers, and the fuse-clamping means prevent release of the drawer-latching means until clamping pressure is removed from the fuses. Interlock means prevents withdrawal of the fuse drawers if a circuit interrupter is closed, prevents closing of either circuit interrupter if a fuse drawer can be withdrawn, and prevents simultaneous closing of both circuit interrupters.

3,579,046
ELECTRICAL HOUSING ASSEMBLY HAVING A PLURALITY OF CHAMBERS WITH ADJACENT CIRCUIT BOARD ELEMENTS
Charles Edward Jordan, Milwaukee, Wis., assignor to Jordan Controls, Inc., Milwaukee, Wis.
Filed May 2, 1969, Ser. No. 821,263
Int. Cl. H05k 5/02, 1/14
U.S. Cl. 317—120 10 Claims



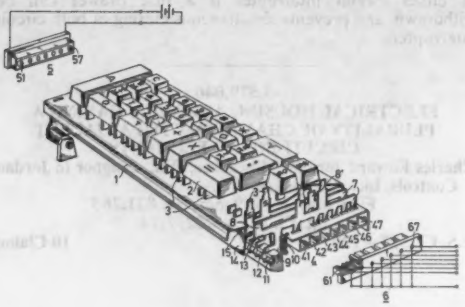
This disclosure includes a housing assembly which can directly replace the usual electromagnetic contactor. The assembly includes opposed similar end housing sections including inwardly projecting and aligned sidewalls. A shallow intermediate wall is interposed between the opposite end sections. Contact boards are provided with a plurality of contact lugs which project outwardly and upwardly along the opposite side edges. The boards are disposed between the end sections and intermediate wall with the contact lugs mating with recesses in the intermediate wall and firmly clamped in place by the ends of the sidewalls of the end sections.

Components are mounted to the circuit boards facing the end sections with printed connections to the opposite side.

3,579,047
KEYBOARD USING SWITCHES HAVING LIGHT OBSTRUCTING ELEMENTS
Konrad Sturm, Nurnberg; Willy Becker, Behringersdorf; Heinz Timm, Brunn, and Karlheinz Rummel, Nurnberg, Germany, assignors to Firma Diehl, Nurnberg, Germany
Filed Feb. 13, 1969, Ser. No. 798,881
Claims priority, application Germany, Feb. 13, 1968, P 15 74 554.7
Int. Cl. G06m 7/00
U.S. Cl. 250—221 12 Claims

Keyboard apparatus for producing switch signal combinations in a code used in office machines includes a number of individual light beam producing means corresponding in number to the number of channels used in the code, and a number of individual keys, each of which carries one or more light-obstructing barriers, the number and position of the barriers on a particular key corresponding to the number and position of the channels used in the machine code system to

indicate the signal combination associated with the key so that when a key is depressed the light beams will be selectively interrupted to thereby form a coded signal representing the depressed key.

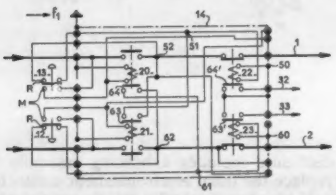


3,579,048

ELECTRIC SAFETY-BOX

Rene Auffret, Savigny-sur-Orge, France, assignor to Nord-Aviation Societe Nationale De Constructions Aeronautiques, Paris, France

Filed Apr. 1, 1969, Ser. No. 811,732
Claims priority, application France, Apr. 4, 1968, 147,069
Int. Cl. H01h *47/16*
U.S. Cl. 317—135 **8 Claims**



Safety-box connected to pushbuttons comprising a first line and a second line, a control relay and a safety relay on each line, each relay jointly controlling a main contact and an auxiliary contact, the main contact of the control relay being normally open and the main contact of the safety relay being normally closed in the position of rest of the pushbuttons, the auxiliary contact of the control relay of the first line being connected in parallel with the rest contact of the pushbutton of a second line between a point located downstream of the main relay of the second line and the control winding of the safety relay of the said second line.

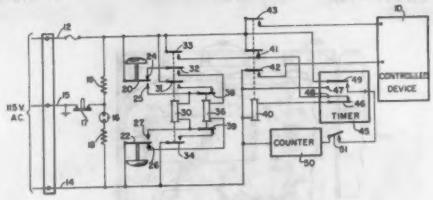
3,579,049

SAFETY CONTROL SYSTEM FOR ACTUATING ELECTRICALLY CONTROLLED MECHANICAL DEVICE

Donald D. Kikta, Downers Grove, Ill., assignor to Grayhill, Inc., La Grange, Ill.

Filed Nov. 28, 1969, Ser. No. 880,657
Int. Cl. H01h *47/22*
U.S. Cl. 317—135 **8 Claims**

A control system for an electrically controlled device for applying energy thereto including first and second hand-operated switches positioned to be actuated by the two hands of an operator, and a relay actuated by simultaneous operation of the switches including a contact for controlling the output circuit which energizes the device. A second relay having normally closed contacts connected in series with contacts of the first relay provides a holding circuit for the first relay which is released only when both hand switches are released. The output circuit may include a third relay for applying power to the controlled device, and which actuates a timer which holds the third relay operated for a predetermined time interval.

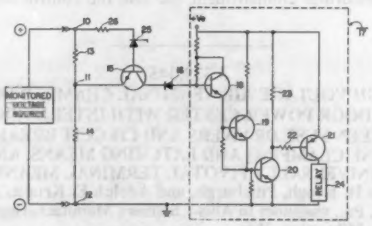


3,579,050

HIGH-LOW VOLTAGE DETECTOR

Rabindra N. Basu, and Alfred Dvorak, Ottawa, Ontario, Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed June 11, 1969, Ser. No. 832,139
Int. Cl. H01h *47/32*
U.S. Cl. 317—148.5 **3 Claims**



A solid-state circuit for monitoring low and high voltage conditions in either direct current or alternating current voltage sources. A single transistor in a current control circuit is biased into or out of current conduction by two sample voltages which are related to the monitored voltage. The current flow is detected. For all values of the first sample voltage which exceed a predetermined minimum value the current control circuit will conduct current, provided also that the second sample voltage does not exceed a predetermined maximum value. Irrespective of the value of the first sample voltage, the current control circuit will cease current conduction when the second sample voltage exceeds the predetermined maximum value. The minimum and maximum sample voltage values define boundary conditions which correspond respectively to the low and high values of the monitored voltage.

3,579,051

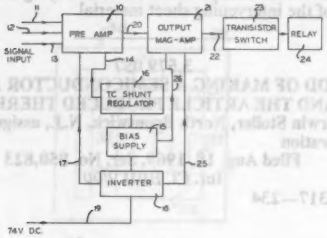
SENSITIVE MAGNETIC AMPLIFIER RELAY DRIVER

Robert M. Olsen, Barrington, Ill., assignor to Vapor Corporation, Chicago, Ill.

Filed Oct. 22, 1969, Ser. No. 868,504
Int. Cl. H01h *47/34*
U.S. Cl. 317—148 **10 Claims**

Electronic circuit capable of responding to a low signal input including a preamp magnetic amplifier circuit receiving one or a plurality of input signals and conditioned to deliver an output signal upon overcoming a reference signal, a

second magnetic amplifier circuit for receiving the output signal of the preamp and conditioned to operate as a switch



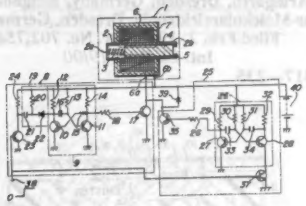
or as a bistable circuit and thereafter trigger a transistor for operating a relay.

3,579,052

SYSTEM FOR DRIVING A. D. C. ELECTROMAGNET

Takaaki Kato, Toyohashi-shi, and Mamoru Kawakubo, Kariya-shi, Japan, assignors to Nippon Denso Kabushiki Kaisha, Kariya-shi, Japan

Filed Aug. 5, 1969, Ser. No. 847,558
Claims priority, application Japan, Sept. 21, 1968, 43/68579
Int. Cl. H02m *7/44, 7/68*
U.S. Cl. 317—148.5 **7 Claims**



A system for driving a DC electromagnet of the kind in which an armature is attracted by the magnetic action of current supplied to an electromagnetic winding, having an attraction starting circuit for generating a DC voltage for a predetermined period of time for completing the attraction of the armature, and an attraction-holding circuit for generating an intermittent voltage. After the voltage generated by the attraction starting circuit is applied to the electromagnetic winding to complete the voltage attraction of the armature, the intermittent voltage generated by the attraction holding circuit is solely applied to the electromagnetic winding for holding the armature in its attracted state. Thus, a large force of attraction is produced by a DC electromagnet having a small physical constitution and heat generated therein can be reduced.

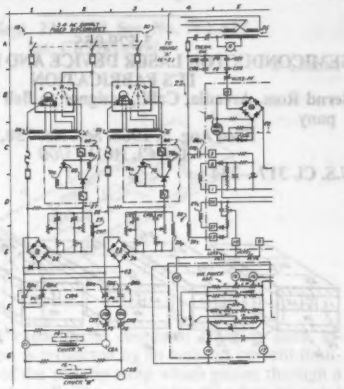
3,579,053

MAGNETIZING AND DEMAGNETIZING APPARATUS AND METHOD

Arthur K. Littwin, 6555 N. Le Mai, Lincolnwood, Ill.

Filed June 26, 1968, Ser. No. 740,052
Int. Cl. H01f *13/00*
U.S. Cl. 317—157.5 **14 Claims**

Apparatus for magnetizing and demagnetizing, including means for adjustable controlling the current and voltage applied to the object to be magnetized, for thereby controlling the speed of magnetic saturation to more accurately sense the level of saturation in the demagnetizing steps.

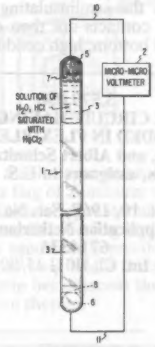


3,579,054

GRAVIMETER UTILIZING MASS OF IONS

David S. Moulton, 145 E. Center St. Apt. 32, Provo, Utah

Filed June 20, 1969, Ser. No. 835,195
Int. Cl. H01g *9/00;* **G01m** *3/40*
U.S. Cl. 317—231 **10 Claims**



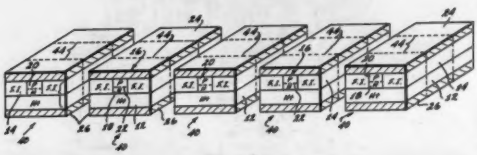
A gravimeter comprising a voltage generator cell and a voltmeter-type instrument responsive to variations of the generated voltages. The cell comprises a tubelike container in which a metal and a solution of its chloride salt cooperate to form the metal ions. The ions form different concentrations at the top and bottom of the tube, and are held in such distribution pattern against the gravitational field force by the electrostatic charge opposing such force. Altitudinal movement of the cell relative to the earth's center changes the gravitational field force with a resulting movement of ions and electrons whereby a variation in the voltage generated by the cell takes place. The change in voltage is generated by the voltage responsive instrument, which may be calibrated to indicate the gravitational field force.

To increase and strengthen the degree of voltage change, a number of cells may be connected serially whereby the voltage variation registered by the voltmeter is the sum of the voltages generated by all the interconnected cells.

ERRATUM

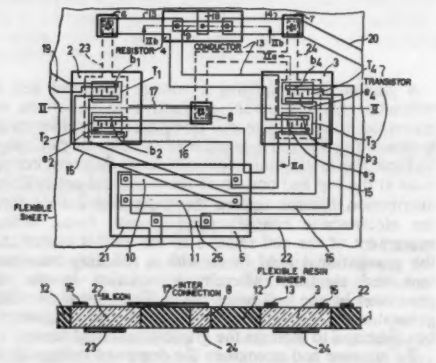
For Class 317—234 see:
Patent No. 3,579,278

3,579,055
SEMICONDUCTOR LASER DEVICE AND METHOD FOR IT'S FABRICATION
Bernd Ross, Arcadia, Calif., assignor to Bell & Howell Company
Filed Aug. 5, 1968, Ser. No. 750,280
Int. Cl. H01l *15/00*
U.S. Cl. 317—234 **10 Claims**



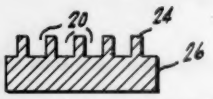
An integral semiconductor diode laser designed for increased heat-dissipation efficiency. A diode element is sandwiched between, and is integral with, layers of semiinsulating semiconductor material. Opposed cleaved surfaces are provided on the device cutting across the diode PN junction and defining a laser cavity through which the PN junction extends. In preparation, a layer of high conductivity semiconductor material is disposed integral with a layer of semiinsulating semiconductor material and the semiinsulating material is grooved to expose portions of the surface of the high conductivity material. Semiconductor material of one conductivity type is then deposited on the exposed high conductivity material, followed by the provision of semiconductor material of opposite conductivity type to form PN junctions within the grooves. The top surface is then lapped to provide coplanarity between the semiinsulating and diode element materials. Electrical contacts are then disposed on the top, coplanar surface and bottom, high conductivity surface.

3,579,056
SEMICONDUCTOR CIRCUIT HAVING ACTIVE DEVICES EMBEDDED IN FLEXIBLE SHEET
Ties Siebolt TeVelde, and Albert Schmitz, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Oct. 10, 1968, Ser. No. 767,062
Claims priority, application Netherlands, Oct. 21, 1967, 6714336
Int. Cl. H01l *15/00*
U.S. Cl. 317—234 **8 Claims**



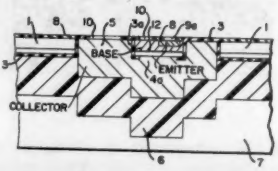
A semiconductor device is described comprising a flexible sheet assembly of separate semiconductor components embedded in an electrically insulating flexible sheet. The contact surfaces of the semiconductor components are exposed. Interconnections may be made between the components by providing metal strips on one or both outer surfaces of the flexible sheet assembly, the connections lying on the outer surface of the intervening sheet material.

3,579,057
METHOD OF MAKING A SEMICONDUCTOR ARTICLE AND THE ARTICLE PRODUCED THEREBY
Arthur Irwin Stoller, North Brunswick, N.J., assignor to RCA Corporation
Filed Aug. 18, 1969, Ser. No. 850,823
Int. Cl. H01l *9/00*
U.S. Cl. 317—234 **11 Claims**



A portion of the surface of a body of single crystalline silicon is etched to provide a wall which is substantially perpendicular to the surface of the body. The body is formed with the surface oriented in a (110) crystallographic plane. The surface is then etched with a crystallographically selective etching solution, such as a hot caustic solution, along a (111) crystallographic plane which extends perpendicularly to the (110) oriented surface.

3,579,058
SEMICONDUCTOR MODULE AND METHOD OF ITS PRODUCTION
Dietrich Armgarth, Dresden, Germany, assignor to Arbeitsstelle Fur Molekularelektronik, Dresden, Germany
Filed Feb. 2, 1968, Ser. No. 702,754
Int. Cl. H01l *19/00*
U.S. Cl. 317—235 **7 Claims**



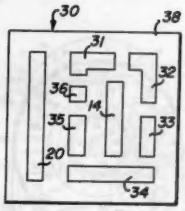
A multilayer junction semiconductor device includes one semiconductive layer of a type of conductivity provided on its upper surface with a recess of a rectangular cross section. Vertical walls and corners of this recess are coated with a thin insulating layer, while the bottom thereof is open. Another semiconductive layer of an opposite type of conductivity is disposed within this recess, so that the critical PN junction area extends perpendicularly to the insulated vertical walls.

The method of producing this device is based on the semiconductive layer inside said recess serving as an initial temporary substratum on which subsequent layers are precipitated.

3,579,059
MULTIPLE COLLECTOR LATERAL TRANSISTOR DEVICE
Robert J. Widlar, Mountain View, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.
Filed Mar. 11, 1968, Ser. No. 712,040
Int. Cl. H01l *11/00*
U.S. Cl. 317—235 **5 Claims**

A lateral transistor device constructed to have a single emitter region and a single base region operatively associated with a plurality of collector regions. Each of the various col-

lector regions forms a separate PN junction with the base region which is dimensioned and disposed with respect to the



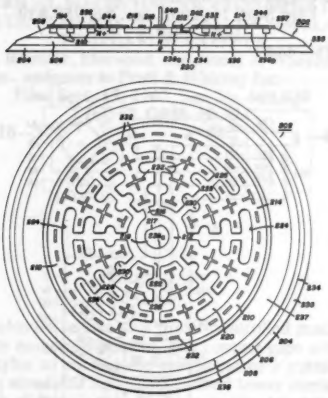
base-emitter junction to provide a predetermined portion of the total available collector current.

3,579,060

THYRISTOR WITH IMPROVED CURRENT AND VOLTAGE HANDLING CHARACTERISTICS

Robert L. Davis, Union Springs, N.Y., assignor to General Electric Company

Filed Mar. 21, 1969, Ser. No. 809,142
Int. Cl. H011 *11/00, 15/00*
U.S. Cl. 317—235R 11 Claims



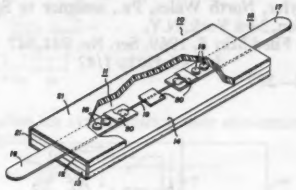
A controlled rectifier is disclosed which is comprised of a main current carrying thyristor which surrounds an integrated gate signal amplifying thyristor. The main thyristor is peripherally beveled to increase the voltage blocking capabilities of the controlled rectifier. The surface of the base layer of the main thyristor is provided with an exposed surface lying at a lower level than the surface of the adjacent emitter layer of the main thyristor, and the exposed base layer surface is interdigitated with the adjacent emitter layer. A metallic contact ohmically connects an emitter layer of the amplifying thyristor to the exposed base layer surface of the main thyristor. The base layer of the main thyristor is also provided with exposed surface portions coplanar with the adjacent emitter layer surface at locations most remote from the fingers of the base layer surface. Additionally, a relatively high resistance current spreading path is provided associated with the emitter layer of the amplifying thyristor, and the amplifying thyristor emitter layer is provided with a minimum spacing from the control lead adjacent the spreading path.

3,579,061

INDIVIDUAL CURRENT-LIMITING FUSE FOR THE ROLLS OF A MULTIPLE ROLL CAPACITOR

Paul L. Waldon, Fort Edward, N.Y., assignor to General Electric Company

Filed Sept. 23, 1968, Ser. No. 761,437
Int. Cl. H01g *1/11*
U.S. Cl. 317—247 6 Claims



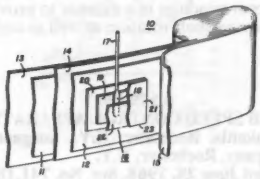
A multiple roll capacitor is disclosed wherein each individual roll section is protected by an isolated current-limiting fuse as a part of the roll tap strap which passes through a central portion of the roll. The current-limiting fuse operates to remove individual defective rolls from the capacitor circuit without significantly adversely affecting the continued operation of the remaining rolls.

3,579,062

ELECTRICAL CAPACITOR WITH THERMAL FUSE

Thomas G. Chapman, Hudson Falls, N.Y., assignor to General Electric Company

Filed Nov. 28, 1969, Ser. No. 880,533
Int. Cl. H01g *1/11*
U.S. Cl. 317—247 11 Claims



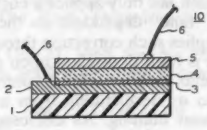
A thermal fuse for a roll capacitor is disclosed wherein a wire lead is joined to a flag of aluminum which is sandwiched between two pieces of insulating material. A narrow strip of a thermal fusible alloy overlies the flag in the sandwich and extends therefrom. This sandwich is positioned in a capacitor roll between a dielectric strip and a foil strip so that the extending fusible alloy strip lies adjacent the capacitor foil strip for electrical connection thereto.

3,579,063

THIN FILM CAPACITOR

Kiyotaka Wasa, and Shigeru Hayakawa, Osaka, Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

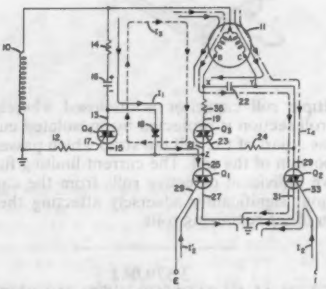
Filed Mar. 24, 1969, Ser. No. 809,801
Claims priority, application Japan, Mar. 25, 1968, Sept. 13, 1968, Sept. 13, 1968, Sept. 13, 1968, 43/19851; 43/66389; 43/66391
Int. Cl. H01g *1/01*
U.S. Cl. 317—258 1 Claim



This invention relates to a thin film capacitor. The capacitor comprises a dielectric layer sandwiched between a top

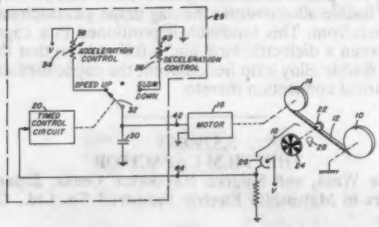
metal electrode and a base titanium electrode which is oxidized at the surface facing said dielectric layer. The dielectric layer consists essentially of a mixture of lead oxide and titanium oxide.

3,579,064
SOLID-STATE MOTOR CONTROL CIRCUIT USING TRIAC ELEMENTS
John R. Taylor, North Wales, Pa., assignor to Sperry Rand Corporation, New York, N.Y.
Filed May 5, 1969, Ser. No. 821,847
Int. Cl. H02p *1/42*
U.S. Cl. 318—207 **9 Claims**



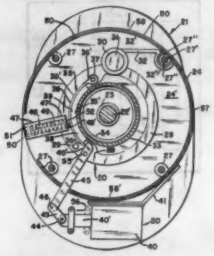
There is disclosed a solid-state control circuit which provides on/off, direction reversal and braking signals for a single-phase motor. The solid-state circuit utilizes a combination of semiconductors which gate AC and DC current through the motor windings in a manner to provide clockwise or counterclockwise shaft rotation as well as on/off and braking signals.

3,579,065
WEB SPEED CONTROL APPARATUS
Joseph F. Laukaitis, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed June 28, 1968, Ser. No. 741,184
Int. Cl. H02p *5/08*
U.S. Cl. 318—314 **4 Claims**



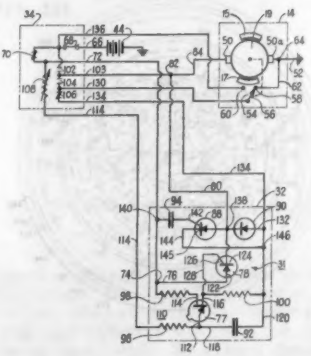
A motor operates to drive a web at a predetermined speed. The speed of the motor is automatically adjusted to assure the proper rate of web speed, such motor being under control of a circuit which not only applies a correction signal to such motor for a "time" dependent on the necessary correction, but also applies such correction through a means the operation of which is itself dependent upon a time constant. This technique permits such broadband control of web speed that accelerating to or decelerating from a reference web speed obtains without hunting. As disclosed the invention uses digital techniques, while incorporating the above-mentioned principles, in such a way that digital-to-analog converter apparatus is obviated.

3,579,066
BRAKE MOTOR ATTACHMENT DEVICE
Clair A. Bearfield, and Raymond Cole, Valley City, N. Dak., assignors to Tri W-G Inc., Valley City, N. Dak.
Filed Apr. 7, 1969, Ser. No. 813,998
Int. Cl. H02k *23/68*
U.S. Cl. 318—372 **2 Claims**



The invention comprises a mechanical brake for an electric motor with a solenoid mechanically connected to a brakeshoe which upon deactuation of the solenoid automatically engages a brakedrum or the rotor of the electric motor to stop the rotation of the motor. The solenoid and electric motor being actuated and deactuated simultaneously and the brakeshoe engagement preventing coasting of the motor after electric current to the motor has been discontinued.

3,579,067
MOTOR CONTROL SYSTEM
William C. Riester, Williamsville, N.Y., assignor to Trico Products Corporation, Buffalo, N.Y.
Filed Sept. 16, 1968, Ser. No. 759,839
Int. Cl. H02p *1/04*
U.S. Cl. 318—444 **8 Claims**

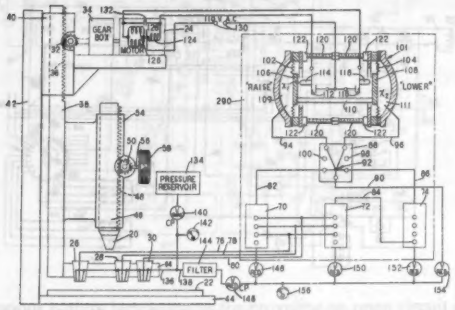


An electric motor-driven windshield wiper system for producing timed dwell periods between cycles of wiper operation incorporating a first silicon-controlled rectifier triggered by a timing network which includes a unijunction transistor which is in turn triggered by an RC circuit. A cyclically actuated switch responsive to motor rotation moves between a running and parking contact. When on the running contact a rectifier is connected in circuit with the motor-energizing circuit and also bypasses the silicon-controlled rectifier thus extinguishing it. A dynamic braking circuit is provided which includes a second silicon-controlled rectifier triggered by charging current of a capacitor in the gate circuit when the cyclically actuated switch moves from the running contact to the parking contact. When the cyclical switch moves to the run position the motor continues to be energized through the rectifier until the cyclic switch reaches the park position thereby triggering the second silicon-controlled rectifier in the dynamic braking circuit.

3,579,068
SERVO CONTROLLED HEIGHT CONTROL

Teh C. Tschang, Springfield, N.J., assignor to Air Reduction Company, Incorporated,, New York, N.Y.

Filed Mar. 11, 1968, Ser. No. 712,217
Int. Cl. G05d *16/00*
U.S. Cl. 318—478 15 Claims

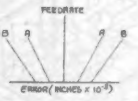


A height control unit for maintaining the desired distance between a tool and a substantially flat workpiece on which the tool is working. The control system utilizes fluidic circuitry to measure the reflected pressure of jets of gas directed at the workpiece. The fluidic circuitry develops a signal in response to the reflected pressure which results in the raising or lowering of the tool.

3,579,069
NUMERICAL MACHINE TOOL CONTROL SYSTEM INCLUDING MEANS TO DIGITALLY SIMULATE A TEMPLATE FOLLOWER

Johann F. Reuteler, Elmwood, and James A. Warren, Simsbury, Conn., assignors to Pratt & Whitney Inc.

Filed Sept. 15, 1967, Ser. No. 668,037
Int. Cl. G05b *19/24*
U.S. Cl. 318—571 14 Claims



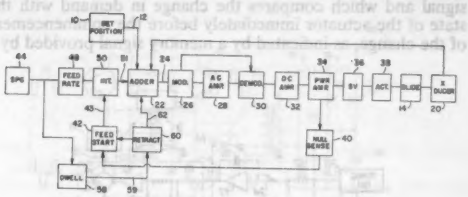
This disclosure relates to a tracer-controlled machine tool adapted for numerical control. The contact gaps actuated by a tracer stylus to control the movement of a cutting tool is electrically simulated and the simulated tracer contact gap is varied with slide velocity. The gap is simulated by a comparison of a velocity signal with a signal proportional to servo position error or lag and the result of this comparison indicates an open or closed contact and actuates a slide drive means in response thereto. This comparison is further utilized to modify the slide velocity to maintain the servo position lag substantially proportional to slide velocity within predetermined limits.

3,579,070
MACHINE TOOL SERVO SYSTEM INCLUDING FEED-RATE CONTROL

Weyman S. Crocker, Springfield, Vt.; Philip H. White, Caremont, N.H., and William T. McDonald, Wayland, Mass., assignors to Pneumo Dynamics Corporation, Cleveland, Ohio

Filed Apr. 15, 1968, Ser. No. 721,479
Int. Cl. G05b *19/24*
U.S. Cl. 318—571 6 Claims

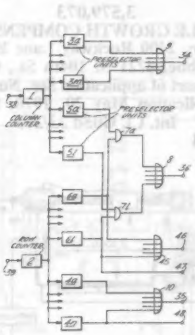
An electronic-hydraulic analog position servocontrol system for slide actuation of a machine tool of the automatic type having a sequential mode of operation including position and rate control of portions of the traverse of the slide. A spindle pulse generator and integrator circuit provide a ramp function rate control signal for combination with position information for synchronizing slide movement with rotation of the spindle.



3,579,071
ELECTRONIC CIRCUIT ARRANGEMENT FOR PERFORMING WORK STEPS IN THE PRODUCTION OR TESTING OF SEMI-CONDUCTOR MEANS

Kurt Drescher, and Reinhard Springer, Dresden, Germany, assignors to Arbeitsstelle Fur Molekularelektronik, Dresden, Haus, Germany

Filed Dec. 23, 1969, Ser. No. 887,708
Int. Cl. G05b *19/28*
U.S. Cl. 318—603 24 Claims



The present invention relates to electronic circuit arrangements for performing predetermined work steps in the production or testing of semiconductor means arranged in rows and columns to form a matrix of said semiconductor means in a coordinate system with individual fields defined at intersections of said rows and columns, wherein row and column measuring and counting means generate coordinate signals which are compared with preselected coordinate digits to produce preselection signals which are channeled through logic circuits to drive means of a positioning apparatus which positions a workpiece support or a tool, for example, in a photorepeater or in a wafer prober, in accordance with the identification of the preselection signals by said logic circuits, whereby any desired extraneous structures may be arranged or tested in said matrix of semiconductor means.

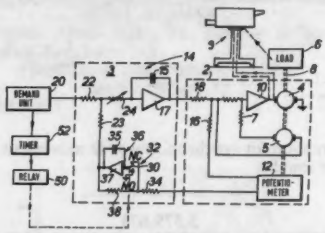
3,579,072
SERVO POSITION CONTROL INCLUDING INTEGRAL CONTROL IN FOREWARD AND FEEDBACK CONTROLS

Dexter Robert Plummer, Leicester; Keith Lawrence Wright, Knighton, and Colin Arthur Wild, Stoneygate, England, assignors to The Rank Organisation Limited, London, England

Filed Oct. 21, 1968, Ser. No. 769,087
Claims priority, application Great Britain, Nov. 3, 1967, 50162/67
Int. Cl. G05b *11/36*
U.S. Cl. 318—609 8 Claims

A control system for an actuator, for example, a positional control motor for a camera, includes a demand unit which

provides demand signals representative of different positions or energization levels of the actuator. A control signal is generated by an integrator which is responsive to the demand signal and which compares the change in demand with the state of the actuator immediately before the commencement of the change, as indicated by a memory signal provided by a



further integrator. This control signal, and the actuator energization level, changes at a rate dependent upon, and preferably proportional to, the change in demand. Preferably, therefore, the system is such that a given change in actuator energization takes place in a time interval which is independent of the magnitude of the change in demand.

3,579,073

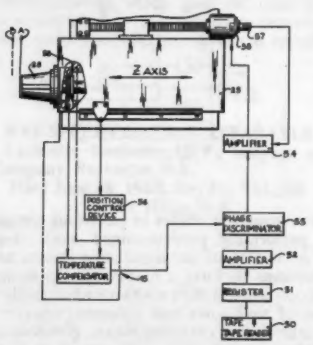
SPINDLE GROWTH COMPENSATOR

Richard Johnstone, 2400 Rockway Lane E., Brookfield, and Richard E. Stobbe, 4221 S. 104th St., Greenfield, Wis.

Continuation-in-part of application Ser. No. 726,964, May 6, 1968. This application May 20, 1970, Ser. No. 37,485

Int. Cl. G05d *23/275*

U.S. Cl. 318—634 **7 Claims**



A device for automatically compensating for the expansion and contraction of the spindle of a machine tool due to different operating temperatures. A thermistor, impedance network is utilized to provide a corrective predetermined control signal to the spindle positioning control circuit.

ERRATUM

For Class 318—696 see:
Patent No. 3,579,279

3,579,074

ELECTRONIC POWERED PULSE AMPLIFIER

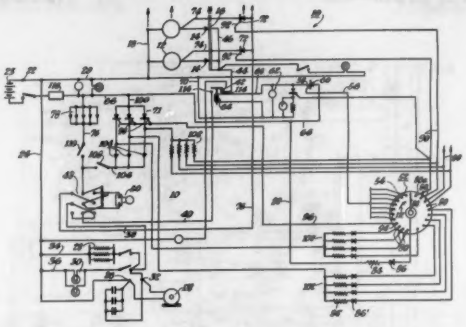
Clement Michael Richell, Warren, Ohio, assignor to Ray R. Roberts, Warren, Ohio, fractional part interest to each

Filed Nov. 2, 1967, Ser. No. 683,760

Int. Cl. H02m *3/00*

U.S. Cl. 320—1 **22 Claims**

A power pulse amplifier comprises a plurality of capacitors, a charging circuit and a discharging circuit. The charging circuit is arranged to connect the capacitors or groups thereof in parallel to a source of charging potential and includes a switching arrangement for charging individual capacitors or the groups thereof individually and sequentially. The discharge circuit is arranged for discharging all of the capacitors or the groups of capacitors simultaneously after all of the capacitors have been charged sequentially. In



certain embodiments the discharge circuit discharges the capacitors simultaneously in parallel while in other embodiments the discharging circuit discharges the capacitors or the groups thereof simultaneously in series.

3,579,075

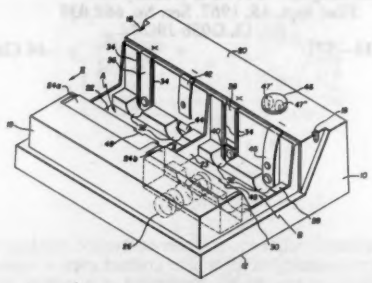
COMPACT BATTERY CHARGER FOR RECHARGEABLE BATTERIES OF VARIOUS PHYSICAL SIZES AND ELECTRICAL CAPABILITIES

Linton E. Floyd, Gainesville, Fla., assignor to General Electric Company

Filed Aug. 14, 1968, Ser. No. 752,543

Int. Cl. H02j *7/02*

U.S. Cl. 320—2 **12 Claims**



A portable device for simultaneously charging a plurality of batteries of different electrical and physical characteristics. The input power consists of standard household alternating current which is converted within the device to half-wave rectified current. A plurality of current limiting charging circuits is provided and an included housing is formed with battery retaining recesses sized to mechanically discriminate each battery so that it will connect only with the corresponding circuit which has been designed to provide a proper charging current for the corresponding batteries.

3,579,076

CHARGE CONTROL SYSTEM FOR BATTERIES

John A. Herbst, Morristown, and Victor H. Seliger, North Caldwell, N.J., assignors to Singer-General Precision, Inc., Little Falls, N.J.

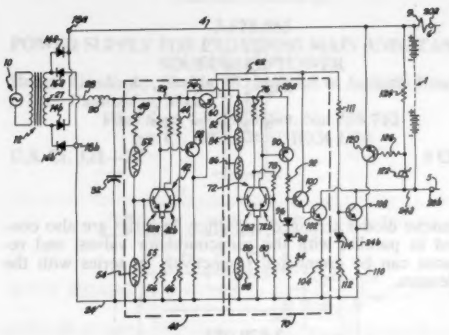
Filed Dec. 30, 1968, Ser. No. 787,940

Int. Cl. H02j *7/04*

U.S. Cl. 320—36 **16 Claims**

A battery charging system including means for connecting a voltage source to the battery in a manner to establish a high

current path and a low current path through the battery, and a switching means connected in said paths and responsive to



various battery temperatures for providing an open circuit in one or more of the paths.

3,579,077

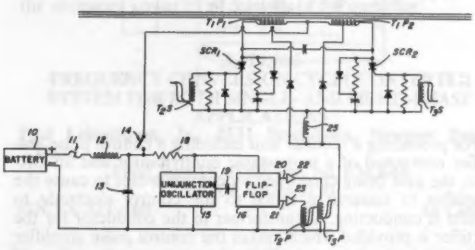
REGULATED STATIC DC TO DC CONVERTER START-UP MEANS

Douglas R. G. Cameron, Montreal, Quebec, Canada, assignor to Pylon Electronic Development Company, Lachine, Quebec, Canada

Filed May 12, 1969, Ser. No. 823,797

Int. Cl. H02m *3/22, 1/18, 7/52*

U.S. Cl. 321—2 **6 Claims**



A static DC to DC converter having an output converter stage comprising a full-wave bridge with an SCR in each of two adjacent legs of the bridge. The firing times of the SCR's are controlled by a variable phase synchronous pulse generator controlled by an operational amplifier having one input connected to a reference voltage source and another input connected to feedback means across the converter's output so that the converter's output voltage is regulated. Means are provided for delaying, during start-up, the application of voltage to the pulse generator to prevent heavy current surges through the SCR's. An overshoot voltage clipper is connected across the output of the operational amplifier.

3,579,078

CONSTANT CURRENT HIGH VOLTAGE POWER SUPPLY

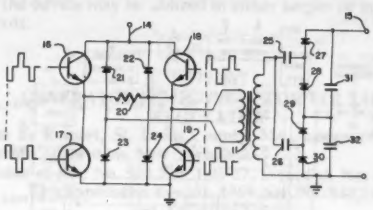
Donald L. Cronin, Anaheim; Bertrand F. Fraber, Palos Verdes Peninsula, and Charles R. Nockey, Canoga Park, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Oct. 6, 1969, Ser. No. 864,067

Int. Cl. H02m *3/32;* **H02j** *1/04*

U.S. Cl. 321—2 **1 Claim**

A direct current DC source and a square wave voltage source are applied to a bridge type switching amplifier. The output of the amplifier is applied to the primary of a step up transformer, and the secondary of the transformer is connected to a voltage quadrupler. The output of the voltage quadrupler is the desired DC voltage output.



3,579,079

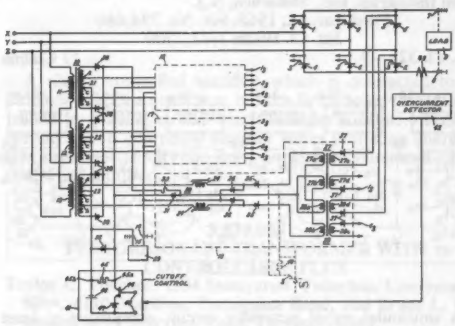
CURRENT SOURCE MAGNETIC GATING CIRCUIT FOR CONTROLLED RECTIFIERS

Fred W. Kelley, Jr., Media, Pa., assignor to General Electric Company

Filed Nov. 17, 1965, Ser. No. 514,430

Int. Cl. H02m *1/08*

U.S. Cl. 321—5 **2 Claims**



For triggering semiconductor controlled rectifiers, an otherwise conventional gate pulse generator is given the characteristics of a current source by connecting in series therewith a nonlinear impedance comprising a diode poled to block gate current and shunted by the series combination of a source of forward bias voltage and a current limiting resistor.

3,579,080

ZERO DEADBAND REVERSING CONTROL

Donald E. Vollrath, Greenfield, Wis., assignor to The Louis Allis Company

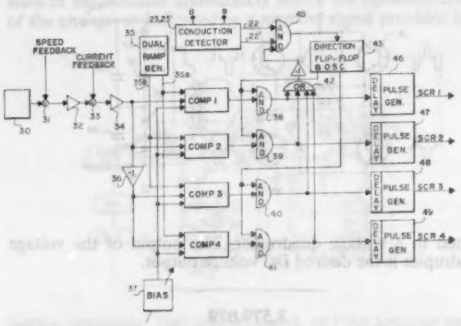
Filed Nov. 13, 1969, Ser. No. 876,470

Int. Cl. H02m *7/68;* **H02p** *1/00*

U.S. Cl. 321—5 **11 Claims**

In a reversible phase controlled rectifier control system, zero deadband response is realized by generating overlapping firing waves for forward current and reverse current conducting controlled switch elements of the phase controlled rectifier and controlling the direction of load current flow substantially instantaneously to provide for current to flow alternately in both directions when the system is in a quiescent state. An oscillator driven flip-flop gates firing between forward current and reverse current conducting controlled switch elements to provide immediate current direction control and lockout. The oscillator is responsive to the state of conduction of the controlled switch elements, permitting the firing signals to pass to forward current conducting controlled switch elements when reverse current conducting controlled

switch elements are nonconductive and vice versa. The oscillator drives the flip-flop between its stable states at a high rate when all controlled switch elements are nonconductive



so that the control system is substantially instantaneously responsive to a command for current to flow in either direction.

3,579,081

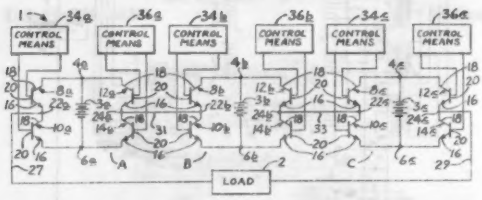
LOW FREQUENCY SINE WAVE GENERATOR CIRCUIT

James W. Bates, Palos Veres Estates, Calif., assignor to Gulton Industries, Inc., Metuchen, N.J.

Filed Nov. 12, 1968, Ser. No. 774,660

Int. Cl. H02m *1/12, 7/00*

U.S. Cl. 321—9 **17 Claims**



A sinusoidal signal generator circuit comprising at least two bridge circuits each comprising two pairs of series-connected bidirectional current control means connected across a source of direct current DC voltage, each bridge circuit having a pair of output terminals at the juncture of the current control means said pairs of current control means at very low frequencies like 60 cycles per second being connected directly in series. The noncorresponding current control means of the pairs of current control means of each bridge circuit are rendered nonconductive sequentially and in different combinations to produce different rectangular pulse output waveforms at the output terminals of said bridge circuit, each waveform respectively comprising positive and negative going pulses of the same amplitude relative to zero, the pulses of the different waveforms each cycle preferably being different in number and phase and of different magnitude, so the waveforms combine in both additive and subtractive relation to produce a resultant stepped sinusoidallike resultant waveform.

3,579,082

ARRANGEMENT FOR DIVIDING AND LIMITING THE VOLTAGE FOR A CONVERTER HAVING A PLURALITY OF THYRISTOR VALVES CONNECTED IN SERIES

Hans Jurg Bossi, Nussbaumen, and Werner Faust, Wettingen, Switzerland, assignors to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

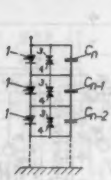
Filed Feb. 10, 1969, Ser. No. 797,994

Claims priority, application Switzerland, Feb. 12, 1968, 2,053

Int. Cl. H02m *7/24*

U.S. Cl. 321—11 **6 Claims**

An electrical converter arrangement comprises a chain of converter valves of the controllable semiconductor type such as thyristors connected in series. Condensers are connected in parallel with the semiconductor valves and the capacitance values of the condensers vary progressively downward in the direction towards the lowest potential point on the chain.



Avalanche diodes arranged oppositely in series are also connected in parallel with the semiconductor valves, and resistances can be connected respectively in series with the condensers.

3,579,083

PROTECTION MEANS FOR RECTIFIERS UPON THE OCCURENCE OF UNDESIRED DISCHARGE CURRENTS

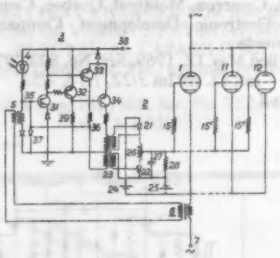
Lennart Bjork, Ludvika, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Nov. 3, 1969, Ser. No. 873,539

Claims priority, application Sweden, Nov. 4, 1968, 14921/68

Int. Cl. H02m *1/18;* **H02h** *7/10*

U.S. Cl. 321—13 **6 Claims**



For protecting a rectifier unit including a control pulse amplifier composed of a monostable multivibrator and an OR-gate, the gate being controlled by control pulses to cause the amplifier to transmit a signal to the control electrode to render it conducting, a transformer in the conductor for the rectifier is provided which makes the control pulse amplifier operative to emit a control signal in response to a flow of current in the conductor produced by an external flashover occurring when the rectifier is not conducting.

3,579,084

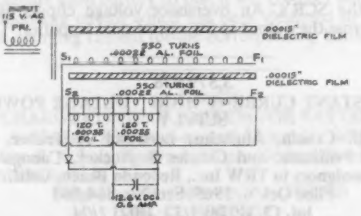
FERRO-RESONANT POWER DEVICE

Elmo E. Moyer, Saratoga Springs, N.Y., assignor to Atto Laboratories, Inc., Rhinebeck, N.Y.

Filed Sept. 10, 1969, Ser. No. 856,570

Int. Cl. H02m *7/06;* **G05f** *3/06;* **H01f** *15/14*

U.S. Cl. 321—16 **4 Claims**


INPUT 115 V. AC PRI.
.0015" DIELECTRIC FILM
550 TURNS .00028 AL. FOIL
550 TURNS .00028 AL. FOIL
120 T. .00028 FOIL
180 T. .00028 FOIL
12.6 V DC 0.6 AMP

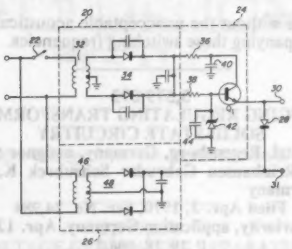
This invention is directed to an integrated ferroresonant stabilizer having a regulated constant voltage output and in

which the secondary windings, of foil interleaved with a dielectric film, provide both inductance and capacitance. A high degree of electrical efficiency is achieved, together with low weight and volume. No external capacitance is required.

3,579,085
POWER SUPPLY FOR PROVIDING MAIN AND STANDBY SOURCES OF POWER

Robert Grodinsky, Skokie, Ill., assignor to Acoustic Research, Inc., Cambridge, Mass.

Filed Sept. 13, 1968, Ser. No. 759,742
Int. Cl. H02m 7/00; H03f 1/00
U.S. Cl. 321—27 **5 Claims**

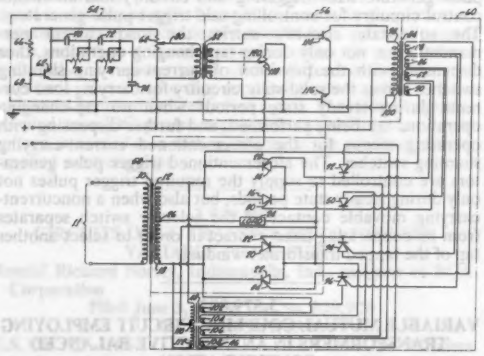


A power supply for high-fidelity amplifier and having a pair of full-wave rectifiers, one with its input permanently connected to line power, the other with a switch for connecting and disconnecting it to line power. The output of the auxiliary rectifier is fed to an input terminal for the amplifier so that portions of the latter can be kept energized at low levels. The other or main rectifier is connected to a regulator to provide a regulated supply and the output of the latter is diode connected to the output of the auxiliary rectifier so that when the main rectifier is turned on it will supply all of the necessary power to all portions of the amplifier.

3,579,086
FREQUENCY CONVERSION CYCLOCONVERTER SYSTEM FOR BOTH SINGLE- AND MULTI-PHASE APPLICATIONS

Paul Lebenbaum, Jr., 2531 Blackthorn, Newport Beach, Calif.

Filed June 19, 1969, Ser. No. 834,644
Int. Cl. H02m 5/30
U.S. Cl. 321—60 **10 Claims**

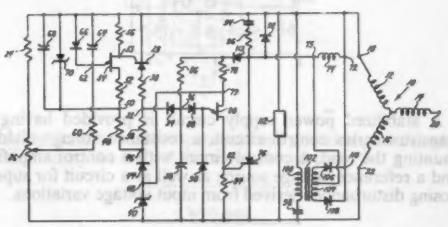


A device for variably decreasing the frequency of a power source by selectively reversing the polarity of the power source voltage applied to a load, wherein the output of the power source and the output of a signal generator, in conjunction, control the polarity of the voltage applied to the load. Such polarity control avoids short circuiting of the power source, reduces circuit complexity, and utilizes power taken directly from the power source output for controlling the polarity switching members. The output voltage of the device may be made proportional to the output frequency, and the device may be utilized in either single- or multi-phase circuits.

3,579,087
GENERATOR SEMICONDUCTOR VOLTAGE REGULATOR

Owen E. Reinert, St. Louis County, Mo., assignor to Sperry Rand Corporation, New York, N.Y.

Division of Ser. No. 568,210, July 27, 1966, Pat. No. 3,470,456.
This application Dec. 31, 1968, Ser. No. 840,544
Int. Cl. H02p 9/30
U.S. Cl. 322—28 **8 Claims**

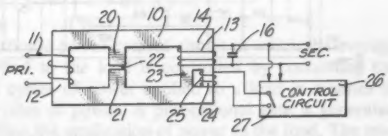


A silicon controlled rectifier, which is connected to the field winding of a generator, has the firing angle thereof controlled by a firing circuit which includes a capacitor; and a second silicon controlled rectifier stores inhibiting energy in that capacitor to vary the firing angle of the first said silicon controlled rectifier.

3,579,088
FERRORESONANT TRANSFORMER WITH CONTROLLABLE FLUX

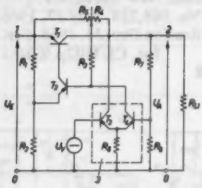
Taylor C. Fletcher, 1534 Sunnycrest, Fullerton, Lawrence M. Silva, 4110 Maritine, Portuguese Bend, and Bruce L. Wilkinson, 4604 Sharynne Lane, Torrance, Calif.

Filed Apr. 8, 1969, Ser. No. 814,393
Int. Cl. G05f 1/38, 7/00
U.S. Cl. 323—6 **17 Claims**



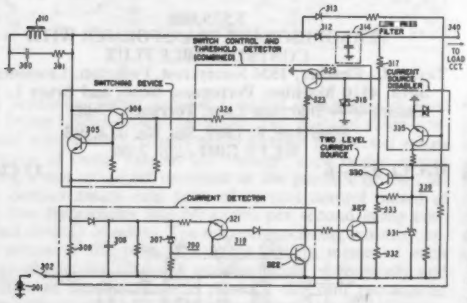
A ferroresonant transformer with means for varying saturation flux capacity for controlling the transformer output. A ferroresonant transformer with at least a portion of the core structure carrying the secondary winding having two separate sections providing parallel magnetic paths for the secondary and resonant flux, with a control winding on one of the sections and a switching circuit for opening and closing the control winding. A low frequency version utilizing E and I laminations with the control winding on one of the outer legs of the E. Another low frequency version utilizing E and I laminations with the control winding encircling a portion of the secondary magnetic circuit. A high frequency version utilizing a plurality of toroid cores with the control winding on one of the cores.

3,579,089
STABILIZED POWER SUPPLY CIRCUITS
Wilfried Elmar Giess, Mannheim, Germany, assignor to Brown, Boveri & Cie Aktiengesellschaft, Mannheim-Kafertal, Germany
Filed Jan. 7, 1969, Ser. No. 789,565
Claims priority, application Germany, Jan. 11, 1968, P 16 13 977.8
Int. Cl. G05f *1/56*
U.S. Cl. 323—22 **6 Claims**



A stabilized power supply circuit is provided having a transistor series control circuit, a resistance voltage divider shunting the load, a control circuit with a control amplifier and a reference voltage source as well as a circuit for superposing disturbances derived from input voltage variations.

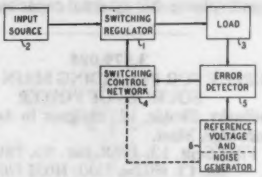
3,579,090
SWITCHING REGULATOR WITH RAPID SWITCHING DRIVE
Eric V. Madsen, New Shrewsbury, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.
Filed May 8, 1969, Ser. No. 823,120
Int. Cl. G05f *1/56*
U.S. Cl. 323—22 **6 Claims**



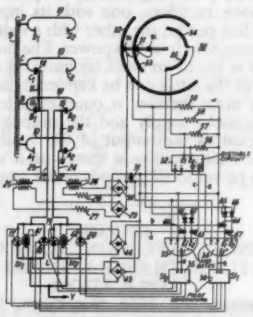
A switching type regulator reduces switching transition times by increasing the magnitude of the switching control signal at the exact interval of the occurrence of the switching transition. The magnitude of the switching control signal is in turn responsive to the output voltage and hence the circuitry to reduce switching transition times also functions to regulate the output voltage.

3,579,091
SWITCHING REGULATOR WITH RANDOM NOISE GENERATOR
Patrick W. Clarke, Murray Hill, N.J., and Rudolph Scuderi, New York, N.Y., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.
Filed May 16, 1969, Ser. No. 825,368
Int. Cl. G05f *1/56, 1/64*
U.S. Cl. 323—22 **7 Claims**

A switching regulator-converter wherein the error detector reference voltage is varied with a random noise signal to permit operation of the switching devices at frequencies in the audible range without the unacceptable acoustical noise normally accompanying these switching frequencies.



3,579,092
TAP-CHANGING REGULATING TRANSFORMER WITH SOLID-STATE CIRCUITRY
Manfred Matzl, Regensburg, Germany, assignor to Maschinenfabrik Reinhausen Gebruder Scheubeck K.G., Regensburg, Germany
Filed Apr. 2, 1970, Ser. No. 24,986
Claims priority, application Germany, Apr. 12, 1969, P 19 18 606.2
Int. Cl. H01f *29/04*
U.S. Cl. 323—43.5S **10 Claims**

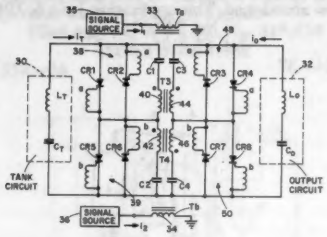


A tap-changing regulating transformer is provided with a tapped winding, a selector switch, a triggerable solid-state circuitry for performing tap-changing operations, trigger pulse generators for triggering said circuitry and automatic control circuitry for controlling said trigger pulse generators. The solid-state circuitry carries the load current permanently, i.e. not only during tap-changing operations, thus dispensing with the provision of current-carrying shunting switches across the solid-state circuitry for carrying load currents during steady state periods when no tap-changing operations are being performed, and further dispensing with operating means for the aforementioned current-carrying shunting switches. The aforementioned trigger pulse generators are controlled to supply the required trigger pulses not only during steady state periods, but also when a noncurrent-carrying movable contact of the selector switch separates from its cooperating fixed contact in order to select another tap of the tapped transformer winding.

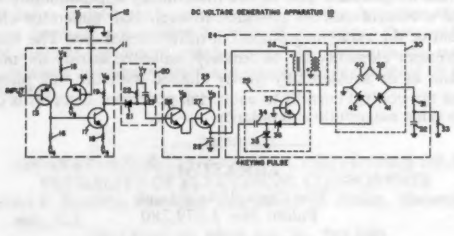
3,579,093
VARIABLE MUTUAL COUPLING CIRCUIT EMPLOYING TRANSFORMERS IN AN INDUCTIVE BALANCED CONFIGURATION
Paul R. Johannessen, Lexington, and Thorleif Knutrud, Sudbury, Mass., assignors to Sylvania Electric Products Inc.
Filed Oct. 29, 1969, Ser. No. 872,312
Int. Cl. H03k *17/18*
U.S. Cl. 323—50 **7 Claims**

A variable mutual coupling circuit employing a plurality of transformers connected in an inductive balanced configuration between an input circuit and an output circuit. Bipolar

switches associated with the transformers are activated in a predetermined sequence to unbalance the inductance and thereby transfer energy from the input circuit to the output circuit.



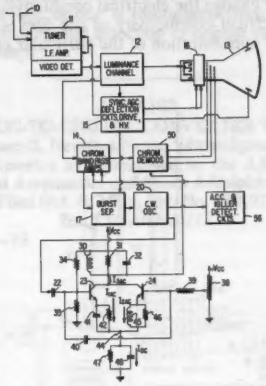
3,579,094
VOLTAGE-GENERATING APPARATUS
Otto A. Jorgensen, Centerport, N.Y., assignor to Hazeltine Corporation
Filed Sept. 26, 1969, Ser. No. 861,378
Int. Cl. H03k *5/00*
U.S. Cl. 323—100 **15 Claims**



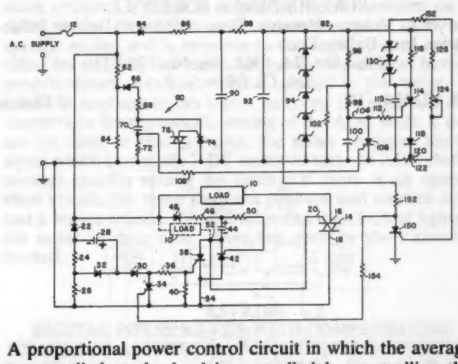
Apparatus for generating a DC voltage whose amplitude is controlled in accordance with variations in the amplitude of supplied control pulses. In one embodiment a DC control signal is developed whose amplitude varies in proportion to variations in the amplitude of a supplied DC reference signal and a pulse-type difference signal in which the amplitude of each pulse is representative of the difference between the amplitude of corresponding supplied control pulses and an additional supplied DC reference signal. The control signal is coupled to a DC power supply for controlling the output voltage in accordance with variations in the amplitude of the supplied control pulses.

3,579,095
CIRCUITS USING TRANSISTORS TO PROVIDE VARIABLE PHASE SHIFT
Ronald Richard Norley, Indianapolis, Ind., assignor to RCA Corporation
Filed June 3, 1969, Ser. No. 829,970
Int. Cl. H03k *1/12*
U.S. Cl. 323—108 **8 Claims**

A phase shift network for providing a variable shift for a frequency signal while maintaining the amplitude thereof relatively constant. The circuit includes first and second transistors having a common collector network and including first and second reactive networks coupled between the emitter electrodes thereof. A common return path is provided for currents flowing through the transistors and means are coupled to one of the transistor's bases to alter the conduction of the transistors, to provide a variable phase change at the collector electrodes, between a first phase angle determined by the first reactive network and a second phase angle determined by the second reactive network.



3,579,096
PROPORTIONAL POWER CONTROL CIRCUIT
Edward E. Buchanan, Jr., Dallas, Tex., assignor to Electronic Control Corporation, Euless, Tex.
Filed May 1, 1969, Ser. No. 821,003
Int. Cl. G05f *1/40*
U.S. Cl. 323—22SC **19 Claims**

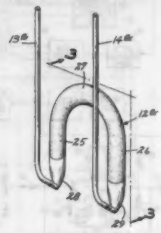


A proportional power control circuit in which the average power applied to the load is controlled by controlling the number of cycles of power applied to a load in a series of available cycles of power. A proportional gate is generated for controlling the application of power to the load. The proportional gate is generated by a circuit which compares a reference voltage that varies in accordance with the demand for power with a ramp voltage whose potential varies as a function of time.

3,579,097
APPARATUS AND METHOD FOR MEASURING THE AMOUNT OF A SELECTED VAPOR IN AN ATMOSPHERE
Alfred J. Luden, Osseo, Minn., assignor to Bureau of Engraving, Inc., Minneapolis, Minn.
Continuation of application Ser. No. 664,808, Aug. 31, 1967, now abandoned. This application Dec. 30, 1969, Ser. No. 888,128
Int. Cl. G01n *27/42*
U.S. Cl. 324—30R **5 Claims**

Apparatus and method for detecting and measuring the concentration of a particular gas in a gaseous mixture. A

nonconductive, nonporous probe having a thin film of relatively nonconductive liquid thereon is placed in the gaseous mixture. The liquid film is capable of absorbing the particular gas to thereby change the electrical conductivity of the liquid film. The electrical conductivity of the film is measured to determine the concentration of the particular gas in the mixture. Preferably the probe is a generally U-shaped glass rod having a roughened exterior surface to aid in retaining the thin film of liquid thereon. The apparatus and process is especially effective to detect and measure the amount of ammonia vapor in the air, using distilled water to form the thin liquid film. As a result, ammonia in solution is readily measured by measuring the vapor in proximity to the solution.

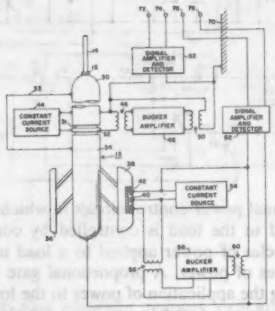


3,579,098

METHOD AND COMBINATION WELL-LOGGING APPARATUS FOR CONDUCTING BOTH DEEP AND SHALLOW INVESTIGATION OF THE FORMATIONS SURROUNDING A BOREHOLE

Marcel L. Mougne, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 24, 1968, Ser. No. 770,221
Int. Cl. G01v *3/18*
U.S. Cl. 324—10 **9 Claims**



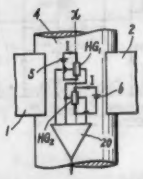
The well-logging instrument comprises, essentially, a focus section have a focus upper guard, a center electrode and lower focus guard. The bottom section of the instrument includes a pad device having a minifocus central button electrode and rings around the central button which serve as microguards. The remote electrode of the focus portion of the instrument is the armor surrounding the logging cable. The lower focus guard serves a dual function in that it is also the minifocus remote electrode. Means are provided for measuring the potential between the focus guard and the cable armor and also between the microguard and the lower focus guard, both measurements then being sent up the logging cable to the surface electronics.

3,579,099

IMPROVED FLAW DETECTION APPARATUS USING SPECIALLY LOCATED HALL DETECTOR ELEMENTS

Takayuki Kanbayashi, 552 Niina, Minoo, Japan

Continuation-in-part of application Ser. No. 598,457, Dec. 1, 1966, now abandoned. This application June 5, 1969, Ser. No. 830,624
Int. Cl. G01r *33/12*
U.S. Cl. 324—37 **7 Claims**



A pair of Hall generator elements are symmetrically mounted in the same magnetic plane closely adjacent a material surface of substantially circular cross section, one Hall generator element being mounted on each side of a null plane, to detect the variations in leakage flux emanating from the material surface as the material is spirally rotated past the Hall generator elements. The Hall generator elements are symmetrically mounted on an axis intersecting a line parallel to the longitudinal axis of the material by approximately 5° and a control current provided to each Hall generator element of the same magnitude but different polarity. The Hall generator elements are, alternately, mounted astride the null plane to be substantially nearly aligned with the null plane and the control current to each Hall generator element is of the same magnitude and polarity.

ERRATUM

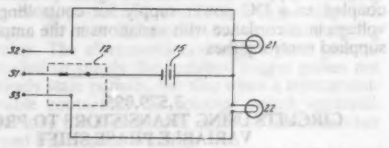
For Class 324—51 see:
Patent No. 3,579,280

3,579,100

FLASHLIGHT ADAPTED FOR SHORT CIRCUIT TESTING

Palmer R. Lauver, 416 N. Second St., Sunbury, Pa.

Filed May 14, 1969, Ser. No. 824,528
Int. Cl. G01r *31/02*
U.S. Cl. 324—53 **4 Claims**



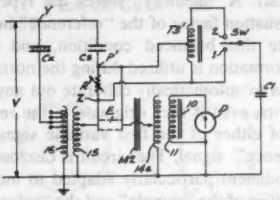
An apparatus is disclosed comprising a flashlight having two bulbs at the light-emitting end, and equipped with a three-pronged adapter at the rearward end. The two bulbs are wired through the batteries and a two position switch such that a short circuit between any pair of terminals of a three-terminal socket is detected by a specific pattern of energized bulbs.

3,579,101

ALTERNATING CURRENT APPARATUS FOR MEASURING CAPACITANCE OR PHASE ANGLE

Norbert L. Kusters, and William J. M. Moore, Ottawa, Ontario, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Apr. 24, 1969, Ser. No. 819,029
Int. Cl. G01n 11/52
U.S. Cl. 324—60 7 Claims



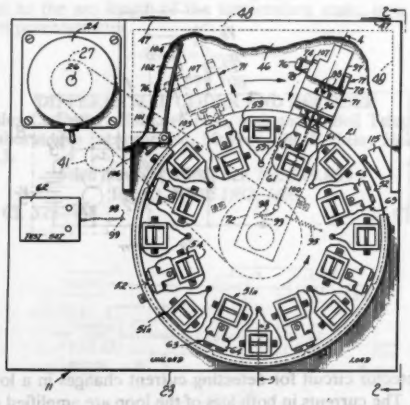
Apparatus of the current comparator type employs a magnetic core, with detection and compensating windings around the core shielded by a further magnetic core from outer ratio windings. A first series circuit is formed with one ratio winding and a capacitor to be measured; a second series circuit with the second ratio winding, a standard capacitor and a variable resistor. The series circuits are connected in parallel across an alternating potential with the currents in the ratio windings in opposition to generate only a difference flux in the cores. Turns of the compensating winding equal in number to the turns of the second ratio winding are connected in a closed series circuit with a third capacitor and a voltage proportional to the voltage drop across the resistor. Balance is detected by zero output from the detection winding. In-phase adjustment is obtained by varying the number of turns in the second ratio winding and hence in the compensating winding. Quadrature adjustment is achieved by the resistor.

3,579,102

APPARATUS FOR TESTING SUCCESSIVE ONES OF A PLURALITY OF ELECTRICAL COMPONENTS

John F. Keating, Fanwood, and Joseph A. Zutkis, Mountainside, N.J.

Filed Sept. 30, 1968, Ser. No. 763,690
Int. Cl. G01r 15/12
U.S. Cl. 324—73 2 Claims



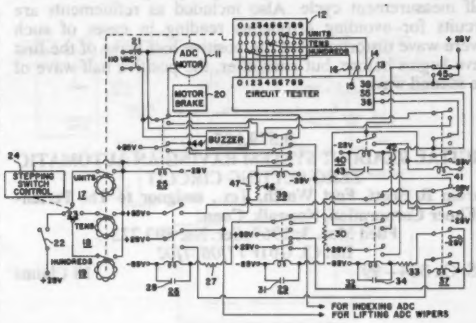
A turntable, having a plurality of pairs of test sockets, is moved rotatably through a load station where relays are placed in the sockets. As the turntable is moved rotatably in a first direction, each pair of relays is aligned successively with a test device, which is then locked against the turntable and connected electrically to the relays to test the relays. After a predetermined rotation of the test device with the turntable, the test device is disengaged from the turntable and is urged in a second direction to engage the next successive pair of relays.

3,579,103

ANALOG-TO-DIGITAL CONVERTER TESTER

Charles H. Russell, Newport News, Va., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Oct. 6, 1969, Ser. No. 863,913
Int. Cl. G01r 15/12
U.S. Cl. 324—73 10 Claims



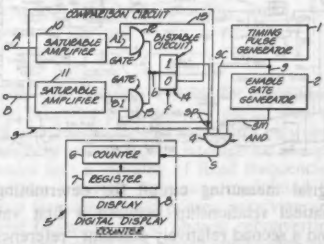
Apparatus for automatically testing an ADC for open and short circuits. A tester is connected to the contacts on the ADC shaft. The ADC motor turns the ADC shaft to a specific setting and in response to this setting means are provided for stopping the motor and producing a signal having a predetermined duration which is applied to the tester. The tester, in response to this signal, performs the open and short circuit tests for the specific setting of the ADC shaft. If there are no open or short circuits, the tester produces another signal which causes the ADC motor to turn the ADC shaft to another specific setting for testing. If there is an open or short circuit, the tester does not produce said another signal and a buzzer sounds. The operator can then look at lights on the tester to determine where the open or short circuit is located.

3,579,104

DIGITAL PHASE METER WITH COMPENSATING MEANS FOR ASYMMETRIC WAVEFORM DISTORTION

Jean Pignard, Annecy, and Bernard Wintz, Cessenaz, France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 21, 1969, Ser. No. 817,968
Int. Cl. G01r 25/00; G04f 9/00, 11/06
U.S. Cl. 324—83D 6 Claims



A phase-measuring instrument for waves of the same frequency is shown in basic form, in which a digital phase shift (or phase delay) reading is obtained and which may be

precalibrated to read numerically in degrees or fractional parts of degrees or radians. A short, basic timing (clock) pulse is first generated every time interval T_o, and these are counted down also to form an enabling gate of very long duration compared to T_o. A coincidence circuit generates a phase delay gate equal in duration to the time between positive-going zero crossovers of two waveforms of the same frequency to be measured. This phase delay gate and the aforementioned basic timing pulses and enabling gates are supplied to the three inputs of a coincidence circuit which operate to pass said timing pulses in bursts equal in duration to said phase delay gates, only when all three of said coincidence circuit inputs are present. A counter then evaluates each of said bursts, providing said digital readout.

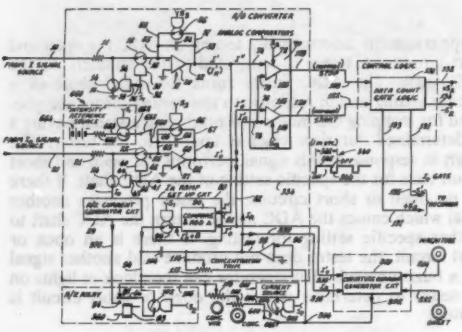
In more sophisticated form, the device takes an average reading between positive-going edges for half of a measurement cycle and between negative-going edges for the other half measurement cycle. Also included as refinements are circuits for avoiding erroneous reading in cases of such severe wave distortion that the positive half wave of the first wave begins before, but ends after, the positive half wave of the second wave.

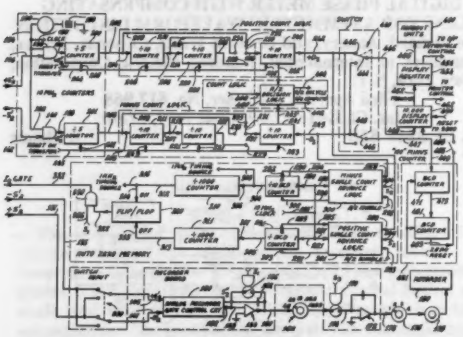
3,579,105

DIGITAL READOUT SYSTEM HAVING AN AUTOMATIC ZERO-SETTING CIRCUIT

Larkin B. Scott, Fort Worth, Tex., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Mar. 3, 1969, Ser. No. 803,723
Int. Cl. G01r *17/06, 1/02*
U.S. Cl. 324—99 **18 Claims**





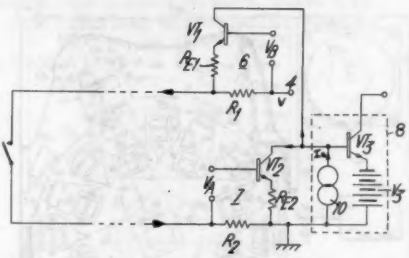
A digital measuring circuit for determining a desired mathematical relationship between a first variable input signal and a second relatively constant "reference" signal includes in addition to the main or computing mode of operation, a second mode of operation for automatically recalibrating the computing circuit. The automatic recalibration is accomplished by supplying at the first input (where the normally variable signal would be applied) a "blank" input which is "expected" to be equal to the second "reference" input. The automatic recalibration circuit mode then causes a change in the effective amplitude value (as by attenuation, for example) of the "reference" signal, so as to create a balance or calibration between the "blank" first signal and the changed "reference" signal (for example making them equal). A "memory" stores the type of change (e.g., the attenuation factor of the "reference" input) necessary to create this balanced condition, and this stored calibration information is utilized during the normal computing mode so as to automatically calibrate out any systematic and other errors, even if they originate in the remote effective sources of either of the first variable signal or of the second "reference" signal. The circuit is disclosed in an exemplary embodiment particularly adapted to measuring the relative intensities of the "sample" and the "reference" beam intensities of a double-beam absorption spectrophotometer. In this exemplary usage, the computed relationship is the logarithm of the ratio of the reference beam intensity to that of the sample beam intensity, and the automatic calibration is accomplished (in a linear mode) by causing the "reference beam" intensity signal to be made equal to a "blank" first signal representing the intensity of the "sample beam" when no absorbing sample material is actually present in this beam. In such an environment, the computed logarithm of the ratio of the two signals may be obtained directly in "absorbance" units, or by further (manual) calibration of the computing circuit directly in terms of the concentration of the (absorbing component of the) sample material.

3,579,106

LOOP CURRENT DETECTOR

Michael Robert Lord, Basildon, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 14, 1968, Ser. No. 775,600
Claims priority, application Great Britain, Nov. 30, 1967, 54588/67
Int. Cl. G01n *7/00*
U.S. Cl. 324—140 **5 Claims**

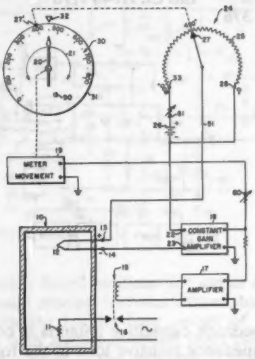


A detector circuit for detecting current changes in a loop circuit. The currents in both legs of the loop are amplified independently and thereafter combined. The combined current is compared against a reference current to produce an output signal when the combined current exceeds the reference current by a predetermined amount sufficient to bias a threshold network.

3,579,107
INDICATING CONDITION CONTROLLER HAVING A FACE INCLUDING A ROTATABLE SCALE PLATE COOPERATING WITH A WIDE ANGLE 250° METER

Edward W. Buttenhoff, Excelsior, and Lyman L. Hill, Jr., St. Paul, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation-in-part of application Ser. No. 752,005, Aug. 12, 1968, now abandoned. This application Dec. 23, 1968, Ser. No. 795,386
Int. Cl. G01n *17/00*
U.S. Cl. 324—157 10 Claims

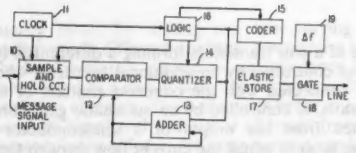


An indicating temperature controller for use in controlling the temperature of an area and indicating the temperature of the area, the controller including a variable magnitude setpoint voltage source which is compared to a thermocouple voltage to originate an error voltage. A scaleplate carries a circular temperature scale. Manual rotation of the scaleplate rotates the temperature scale about an axis. A meter whose pointer is at rest (zero energization) at a position between extremities of movement is energized by the error voltage and has a pointer which rotates about the axis and is capable of swinging through an arc substantially equal to the arc length of the temperature scale. The setpoint voltage source includes a potentiometer. The scaleplate is coupled to rotate as the potentiometer wiper moves, so that the rest position of the pointer indicates the setpoint temperature and the pointer position indicates the thermocouple temperature. The potentiometer may be a potentiometer having a circular resistance element whose arc length is also substantially equal to the arc length of the temperature scale, or a multiturn potentiometer.

3,579,108
DIFFERENTIAL CODER AND DECODER

Cassius C. Cutler, Holmdel, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Nov. 29, 1968, Ser. No. 779,859
Int. Cl. H04b *1/02, 1/06*
U.S. Cl. 325—38 22 Claims

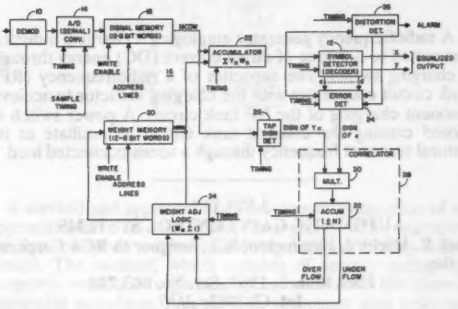


A differential coding system is proposed which, when the slope of the message signal to be coded is large, accelerates the production of the output of a quantizer which is used to encode the message signal. A digital coder and elastic store are interposed between the quantizer and transmission line to insure that the digitally coded signal is transmitted at a desired line rate while the production of those digital signals may be significantly greater than the line rate. A decoder is utilized at the receiver which functions in the inverse manner and enables the coded message signal to be decoded.

3,579,109
AUTOMATIC EQUALIZER FOR DIGITAL DATA TRANSMISSION SYSTEMS

Derek J. Hatley, Monroe, N.Y., assignor to General Dynamics Corporation

Filed Apr. 2, 1969, Ser. No. 812,691
Int. Cl. H03k *13/34*
U.S. Cl. 325—42 21 Claims

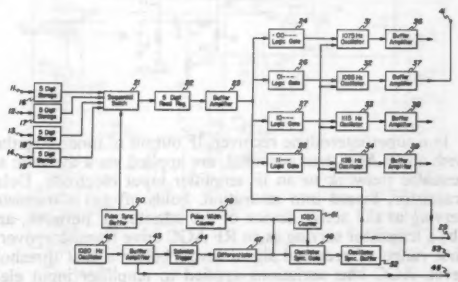


An adaptive equalizer is described wherein the data signal received from a line is digitized and is digitally corrected on a serial bit-by-bit basis so as to compensate for any distortion introduced by the transmission channel.

3,579,110
DIGITAL DATA CONDENSATION SYSTEM

Erwin J. Hauber, 1316 Lindenwood Drive, El Cajon, Calif.

Filed Sept. 20, 1968, Ser. No. 761,143
Int. Cl. H04j *3/04*
U.S. Cl. 325—47 4 Claims

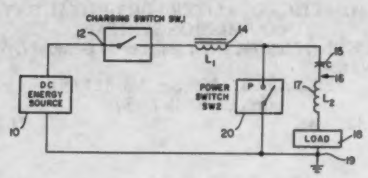


A digital data condensation system for simultaneously transmitting and receiving a plurality of digital data signals on a bandwidth which normally accommodates only one such signal by sequentially converting the intelligence of a plurality of binary codes into a plurality of fixed frequencies and phases; transmitting a carrier frequency modulated by the plurality of fixed frequencies and phases; receiving and detecting the fixed frequencies and phases; reconverting the fixed frequencies and phases into binary intelligence by comparing the received fixed frequencies and phases with fixed frequencies and phases synchronously generated in the receiver and reading out of original binary intelligence.

3,579,111
RADIO FREQUENCY PULSE GENERATOR USING DC CHARGING

Paul R. Johannessen, Lexington, and Thorleif Knutrud, Sundbury, Mass., assignors to Sylvania Electric Products Inc.

Filed Oct. 29, 1969, Ser. No. 872,318
Int. Cl. H04b 1/04
U.S. Cl. 325—141 5 Claims

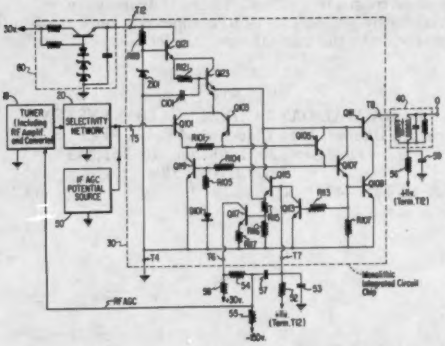


A radiofrequency generator employing a charging inductor connected to a source of direct current (DC) energy through a charging switch. The capacitor of a radiofrequency (RF) tank circuit cooperates with the charging inductor to achieve resonant charging of the RF tank circuit. A power switch is closed causing the charged tank circuit to oscillate at its natural resonant frequency through a series-connected load.

3,579,112
AUTOMATIC GAIN CONTROL SYSTEMS

Jack R. Harford, Flemington, N.J., assignor to RCA Corporation

Filed Mar. 3, 1969, Ser. No. 803,728
Int. Cl. H03g 3/30
U.S. Cl. 325—319 10 Claims

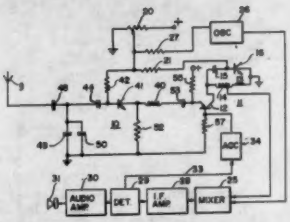


In a superheterodyne receiver, IF output of tuner, together with an IF AGC bias potential, are applied via a dynamic attenuator network to an IF amplifier input electrode. Delay transistor, biased into saturation, holds off (a) a transistor serving as the active device of the attentuator network, and (b) a transistor serving as an RF AGC drive transistor, over a first range of received signal levels below a first threshold level. AGC bias variations applied to amplifier input electrode varies IF amplifier gain without affecting IF attenuator or tuner in the first range. At a given AGC bias level (to which delay transistor base is responsive) delay transistor comes out of saturation and its collector potential (to which the bases of attenuator and RF AGC transistors are responsive) varies inversely with AGC bias. At first threshold level, delay transistor collector potential departs sufficiently from saturation potential to initiate RF AGC transistor conduction, and RF AGC action commences. A full range of RF AGC action is traversed before delay transistor collector potential arrives at level-initiating attenuator transistor conduction. Beyond this second threshold level, attenuator action occurs and a negative DC feedback loop is closed which holds IF amplifier bias relatively constant. Receiver signal control thus follows sequence including at least three phases: (1) a weak-signal phase, wherein AGC action is confined to IF amplifier gain variations; (b) a medium-signal phase, wherein IF amplifier gain variations are accompanied by RF amplifier gain variations; and (c) a strong-signal phase, wherein control is confined essentially to IF attenuator action.

3,579,113
ANTENNA COUPLING CIRCUIT

Kamil Y. Jabbar, River Grove, and Ole K. Nilssen, Bensenville, Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Mar. 14, 1969, Ser. No. 807,372
Int. Cl. H04b 1/18
U.S. Cl. 325—376 7 Claims

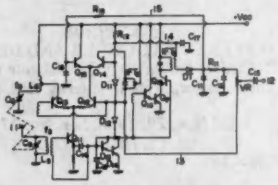


A high impedance capacitive antenna is coupled in series with a low impedance resistive load in the form of the input circuit of an RF transistor amplifier through a series-tuned circuit including a varactor diode connected in series with an inductor. A source of DC biasing potential is provided to vary the biasing voltage on the diode in order to change its capacitance to tune the circuit over a predetermined band of frequencies. The circuit operates to transfer constant power at constant bandwidth from the antenna to the load over a wide range of frequencies, utilizing only a restricted range of capacitance change of the diode capacitance.

3,579,114
AUTOMATIC GAIN CONTROL SYSTEM RADIO RECEIVERS AND THE LIKE

Tokinori Kozawa, Kokubunji-shi; Noboru Kuzuma, and Ichiro Miwa, Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo-to, Japan

Filed July 24, 1968, Ser. No. 747,237
Claims priority, application Japan, Aug. 21, 1967, Sept. 18, 1967, 42/53259; 42/59449
Int. Cl. H04b 1/16
U.S. Cl. 325—410 14 Claims

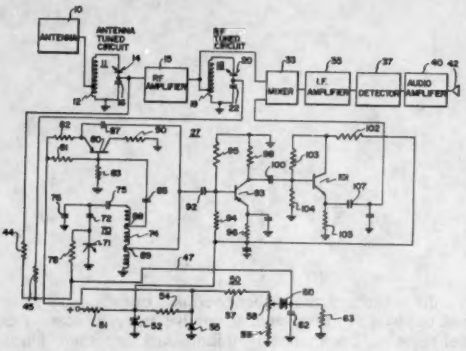


One of a pair transistors forming a differential-type amplifier and controlled by an additional transistor whose collector is connected with the common emitters of the pair of transistors, is controlled by an automatic gain control signal obtained from the output of a semiconductor detection device, so as to adjust the current flow through the other one of the pair of transistors. The potential difference between the respective bases of the pair of transistors is defined by the offset voltage across the semiconductor detection device, thereby the operating point of the differential-type amplifier can be determined adequately.

3,579,115
ELECTRONICALLY TUNED OSCILLATOR

Nikolai Goncharoff, Roselle, and Kamil Y. Jabbar, River Grove, Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Feb. 11, 1969, Ser. No. 798,292
Int. Cl. H04b 1/26
U.S. Cl. 325—438 11 Claims

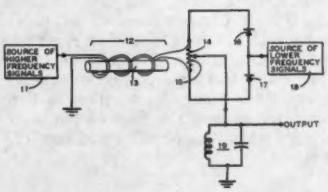


An electronically tuned oscillator for use as a local oscillator in an AM radio receiver includes a transistor as the active component, with the emitter-base circuit of the transistor being supplied with signals obtained from two taps on the coil of the tank circuit of the oscillator. The tank circuit is tuned by use of a varactor or hyperabrupt diode supplied with tuning voltages obtained from a potentiometer connected across a DC source. The collector of the transistor is connected through a resistor to ground potential, and the taps are located to cause the reflected capacitance from the transistor across the tuning diode to be minimized, while at the same time providing sufficient energy to drive the transistor. The output of the transistor then is AC-coupled to a transistor amplifier stage which is AC-coupled to an emitter follower, the output of which supplies the oscillator signals to a mixer circuit in the radio receiver.

3,579,116
FREQUENCY MIXER

Herbert Knirsch, Erding, Klettham, Germany, assignor to Schlumberger overseas Messgeratebau und Vertrieb G.m.b.H., Munich, Germany

Filed Dec. 10, 1968, Ser. No. 782,687
Int. Cl. H04b 1/26
U.S. Cl. 325—439 5 Claims

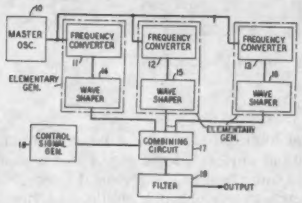


A frequency mixer for mixing two time-varying input signals of substantially different dominant frequencies has the signal of higher frequency applied to an impedance having two ends connected in a circuit with two assymetrically-conductive, nonlinear elements. These elements serve to mix the higher frequency signal with the signal of lower frequency, the two elements being poled in the same current-conducting direction and the latter signal being applied to a junction intermediate the two elements. The higher frequency signal is applied to the two ends of the impedance by a balun comprising two parallel conductors wound upon a high-frequency transformer element; one end of the conductor receiving the signal of higher frequency and the other end being connected to ground potential which traces through to a corresponding end of the impedance. A circuit tuned to a desired sum or difference frequency has s signal output end connected to a point on the impedance between the two ends thereof.

3,579,117
WAVEFORM GENERATOR

Walter E. Norris, Ballardvale, Mass., and Stephen D. Shoap, Matawan, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Sept. 27, 1968, Ser. No. 763,301
Int. Cl. H03k 5/08
U.S. Cl. 328—27 4 Claims

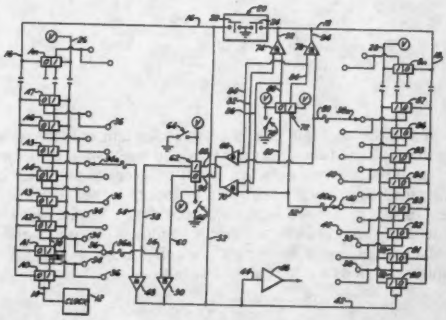


A method and apparatus for time-domain generation of an approximation to an ideal waveform for signaling synchronously via a bandlimited transmission facility is disclosed. The method, which consists of serially gating appropriate waveform segments so as to achieve the desired composite waveform, presents the advantage over prior art that time-domain techniques are invoked in the task of waveform generation, to supplement the work of frequency-domain techniques (filtering).

3,579,118
MULTIPLE MODE FREQUENCY DIVIDER CIRCUIT

Donald F. Rhodes, Pittsburgh, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Sept. 26, 1969, Ser. No. 861,382
Int. Cl. H03k 21/00
U.S. Cl. 328—41 10 Claims

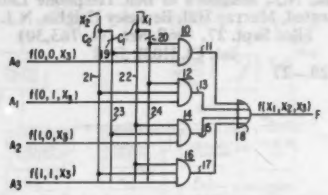


Providing various frequency and pulse repetition combinations, including single frequency, and two predetermined numbers of output pulses at each of two frequencies comprising a first cascade of flip-flops fed from a pulsing clock with means to tap two selected flip-flops in the cascade to set the two output frequencies. A second similar cascade of flip-flops includes means to set the two predetermined numbers of pulses. The two cascades are interconnected by means including control flip-flops, whereby switching from one to the other settings on, and resetting of both arrays, are accomplished.

3,579,119
UNIVERSAL LOGIC CIRCUITRY HAVING MODULES WITH MINIMUM INPUT-OUTPUT CONNECTIONS AND MINIMUM LOGIC GATES

Sik-Sang Yau, and Calvin K. Tang, Evanston, Ill., assignors to Northwestern University, Evanston, Ill.

Filed Apr. 29, 1968, Ser. No. 724,701
Int. Cl. H03k *19/00, 19/12, 19/20*
U.S. Cl. 328—92 21 Claims

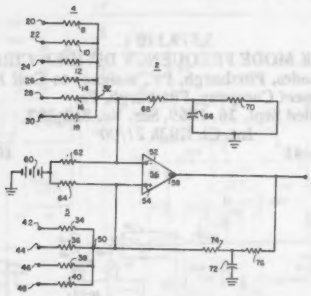


Universal logic circuitry for a large number of variables using identical universal logic circuits of a small number of variables having a minimal number of logic gates and input-output circuits as modules in a multilevel arrangement.

3,579,120
SELF-TESTING LOGIC GATE

Peter Curran, Hastings-on-Hudson, N.Y., and John Delistovich, Jersey City, N.J., assignors to The Bendix Corporation

Filed Mar. 28, 1969, Ser. No. 812,575
Int. Cl. H03k *19/00, 5/20*
U.S. Cl. 328—92 5 Claims



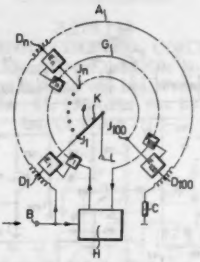
A self-testing logic gate used in redundant control systems performs logic functions on AC coded input signals by means of an input resistor network and a differential amplifier having inverting and noninverting inputs. The amplifier is responsive to the AC inputs for providing a square wave output and when a logic circuit failure occurs, normally balanced DC amplifier inputs are unbalanced so that the amplifier provides a steady state DC output.

3,579,121
APPARATUS FOR DETECTING NONRECURRENT PULSES IN THE NANOSECOND RANGE WITH A DELAY LINE

Eugen Haag, Karlsruhe, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Jan. 15, 1969, Ser. No. 791,463
Claims priority, application France, Feb. 16, 1968, 140,140
Int. Cl. G11c *11/26*
U.S. Cl. 328—124 11 Claims

An apparatus for obtaining, with a delay, amplitude values of a nonrecurrent signal pulse of a duration in the nanosecond or subnanosecond range. The signal pulse is applied to a delay line having a plurality of spaced taps, to each of which there is connected a sampling station. Entering the delay line, the signal pulse triggers a scanning signal that travels along a scanning signal path with a speed different from the speed of the signal pulse traveling in the delay line.

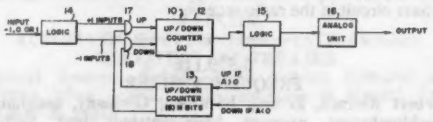


Thus, the scanning signal either overtakes or falls behind the signal pulse and during such a relative travel it scans the signal pulse and causes storing of individual amplitude values in said sampling stations from which the stored values may be sequentially picked up for a visible recording of the signal pulse curve.

3,579,122
DIGITAL FILTER FOR REDUCING SAMPLING JITTER IN DIGITAL CONTROL SYSTEMS

Thomas O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Tage O. Anderson, Arcadia, and William J. Hurd, La Canada, Calif.

Filed Dec. 23, 1969, Ser. No. 887,701
Int. Cl. H03k *21/18*
U.S. Cl. 328—167 10 Claims



A digital filter comprising two up-down counters A and B. Counter A which is responsive to a sampled input signal which is quantized into three levels +1, −1 and 0, is incremented in response to each +1 input, decremented in response to each −1 input, and remains unchanged in response to a 0 input. Counter B, which includes N stages, is incremented at each sampling time when A is positive, decremented when A is negative and remains unchanged when A is zero. When B overflows in a positive direction A is decremented by one while a negative overflow of B results in A being incremented by one. The filter output is $+2^{LN}$ when A is positive, -2^{LN} when A is negative and zero (0) when the count in A is zero.

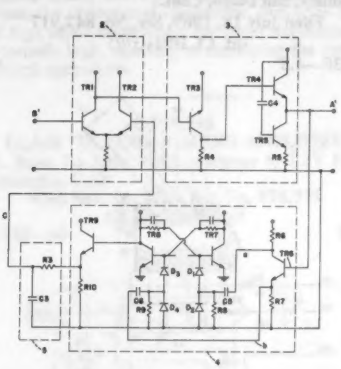
3,579,123
DC RESTORER APPARATUS

Hirotoshi Koga, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed Aug. 21, 1969, Ser. No. 851,991
Claims priority, application Japan, Aug. 23, 1968, 43/59899
Int. Cl. H04b *1/12*
U.S. Cl. 328—164 9 Claims

DC restorer apparatus is provided in accordance with the teachings of the present invention for restoring the DC and low frequency components to a pulse train received in a facsimile or data transmission system. The DC restorer ap-

paratus provided comprises adder means for summing first and second input signals applied thereto and for providing an output signal representative of the received pulse train with the DC and low frequency components restored thereto. The adder means is adapted to have the received pulse train applied to the first input thereof while the output of a feedback loop, which includes both bistable circuit means and low-pass



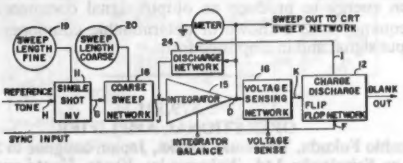
filter means, is applied as the second input thereto. The bistable circuit means is adapted to be driven by the output produced by such adder means and the output of the bistable circuit means is applied through the low-pass filter means to the second input of said adder means. The filtered output of the bistable circuit means is thus added to the received pulse train whereby the DC and low frequency components thereof are restored.

3,579,124

COMPENSATED SWEEP GENERATOR

John Henry O'Hara, Bowie, Md., assignor to The United States of America as represented by the Secretary of the Army

Filed May 12, 1969, Ser. No. 823,911
Int. Cl. H03k *4/10, 4/86*
U.S. Cl. 328—181 **8 Claims**



An apparatus for generating a frequency-compensated sweep. A signal containing wow and flutter deviations is applied to the input of the generator, wherein these deviations are compensated for by increasing or decreasing the instantaneous value of the sweep voltage. An integrator portion of the generator generates the compensated sweep. The output of the integrator is a stairstep voltage, the rate of change of voltage varying as the input frequency varies with wow and flutter. The generator compensates for instantaneous variations in the time base due to wow and flutter by generating a time base that is a function of the wow and flutter. Either the number, amplitude, or width of the input pulses may be changed to vary the time base.

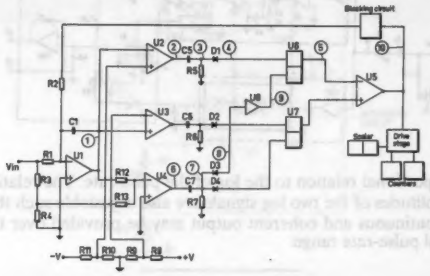
3,579,125

APPARATUS FOR RESETTING AN ANALOG INTEGRATOR

Lars A. Lindblad, Klingen, and Rune N. Kahlbom, Uplands Vasby, Sweden, assignors to Junger Instrument Aktiebolag, Stockholm, Sweden

Filed Nov. 25, 1968, Ser. No. 778,658
Int. Cl. G06g *7/18*
U.S. Cl. 328—127 **1 Claim**

Apparatus for resetting an analog integrator with digital readout capability. The resetting signal, which discharges the integrating capacitor, is terminated when the output of the integrator reaches a level which is proportional to the analog input signal instead of completely discharging the integrating capacitor. This compensates for the errors present in prior art analog integrators caused by ignoring the analog input



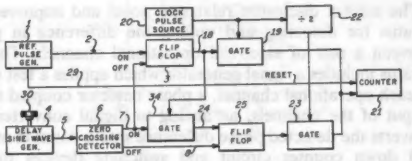
signal during the discharge time of the integrating capacitor. During the discharge of the integrating capacitor, an operational amplifier compares the integrator output voltage with a signal proportional to the analog input signal, called the compensating voltage. When two signals are equal the resetting signal is terminated.

3,579,126

DUAL SPEED GATED COUNTER

John J. Paul, Montreal, Quebec, Canada, assignor to Sperry Rand Canada Limited, Toronto, Ontario, Canada

Filed Oct. 17, 1968, Ser. No. 768,487
Claims priority, application Canada, Aug. 29, 1968, 028,840
Int. Cl. H03k *17/28*
U.S. Cl. 328—129 **4 Claims**



Counting apparatus for determining the elapsed time between a reference pulse and the next following positive peak of a delayed sine wave irrespective of the DC level of the sine wave. The apparatus comprises a clock pulse source producing full rate and half rate pulses which are applied through respective gates to a single pulse counter. The first (full rate) gate is turned on by the reference pulse and is turned off upon the first following positive-going crossover of the delayed sine wave. The second (half rate) gate is turned on simultaneously with the termination of the first gate and is turned off upon the next following negative-going crossover of said delayed sine wave.

3,579,127

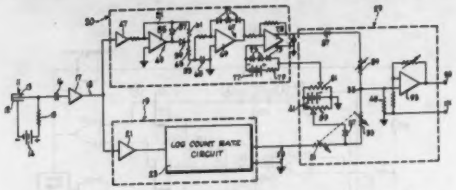
APPARATUS FOR MONITORING PULSES

Harold A. Thomas, San Diego, Calif., assignor to Gulf Energy & Environmental Systems, Inc., San Diego, Calif.

Filed May 31, 1967, Ser. No. 642,390
Int. Cl. G06g *7/24;* **G01t** *1/15*
U.S. Cl. 328—145 **5 Claims**

Apparatus is described for producing an output signal generally proportional to the log of the rate of random pulses, which rate varies over a total pulse-rate range of sufficient magnitude as to require at least two different monitoring techniques. Means utilizing the respective techniques are provided for producing log signals representing the pulse rate

of the random pulses in lower and upper portions of the total pulse-rate range. The log signals representative of the pulse rate in the respective ranges are adjustable to have the same



proportional relation to the log of the pulse rate. The relative amplitudes of the two log signals are also adjustable such that a continuous and coherent output may be provided over the total pulse-rate range.

3,579,128

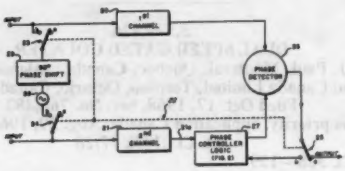
PHASE CONTROLLER

Ervin Smith, Timonium, and John O. Wedel, Baltimore, Md.

Filed Feb. 12, 1969, Ser. No. 798,658

Int. Cl. H03b *3/04*

U.S. Cl. 328—155 **5 Claims**



The subject disclosure relates to novel and improved apparatus for detecting and nulling the difference in phase between a pair of electrical operational channels. The apparatus includes a signal generator which applies a test signal to each operational channel, a phase detector coupled to the output of the channels, an analog to digital converter that converts the detected phase difference into a count in and up and down counter circuit and switching devices that in response to the output of the counter couple phase shift elements into one of the channels so as to equalize the phase between the two channels.

3,579,129

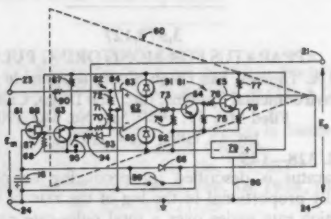
VOLTAGE-HOLDING CIRCUIT AND METHOD

Robert G. Irvine, Claremont, Calif., assignor to LTV Ling Altec, Inc., Anaheim, Calif.

Filed Apr. 25, 1969, Ser. No. 819,380

Int. Cl. H03f *3/16, 5/00*

U.S. Cl. 330—3 **11 Claims**



A voltage-holding circuit for sampling a signal voltage at a given instant or at the peak of the voltage and for holding the sampled or peak voltage for an extended period of time; and a method for holding a peak or sampled voltage for an extended period of time.

3,579,130

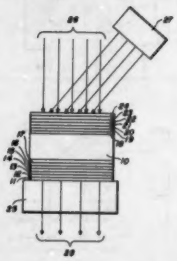
THIN FILM ACTIVE INTERFERENCE FILTER

Vern N. Smiley, San Diego, Calif.

Filed July 18, 1969, Ser. No. 842,917

Int. Cl. H01s *3/05*

U.S. Cl. 330—4.3 **6 Claims**



A thin film of active laser material having a thickness of an integral number of one-half wavelengths of the laser emission energy is disposed between two multilayer films having high reflectance properties relative to the wavelength of energy emitted by the active laser material while offering relatively good transmittance to a source of energy directed to the active laser material to raise its energy level. The multilayer films are each comprised of a number of layers alternating in high and low index of refraction and having a thickness of the order of one-quarter wavelength of the emitted laser energy. The multilayer high reflectance films disposed on either side of the thin film of active laser material may be supported on an appropriate substrate and the assembly is positioned in the path of an input signal which it is desired to filter and amplify as well as in the path of a source of excitation energy to produce an output signal commensurate in frequency with a known or determinable component of the input signal and in amplified form.

3,579,131

OPERATIONAL AMPLIFIER

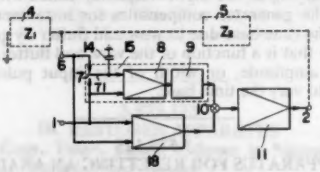
Toshio Fukuda, Takatsuki, Osaka, Japan, assignor to Shimadzu Seisakusho Ltd., Nakagyo-ku, Kyoto, Kyoto-prefecture, Japan

Filed Oct. 8, 1968, Ser. No. 765,957

Claims priority, application Japan, Oct. 10, 1967, 42/65087

Int. Cl. H03f *1/02, 1/14*

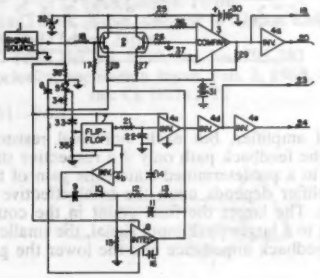
U.S. Cl. 330—9 **1 Claim**

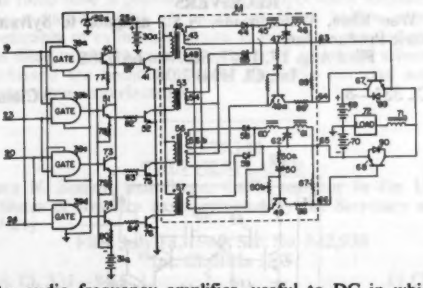


An operational amplifier for constituting an apparatus such as, for instance, an analog computer. The amplifier has a very high input impedance so that only a very low value of signal current is drawn from the signal source. A stationary component in the signal voltage appearing at the signal input terminal is amplified by a chopper-stabilized direct-current amplifier having a chopper and a synchronous demodulator,

and then is applied to a feedback point located at the junction between the two operational impedances, after passing through a direct-coupled amplifier. The voltage at the feedback point is equilibrated to the input signal applied to the input signal terminal by feedback action, and in reaction to this equilibrium value, output voltage is taken out at the output terminal. Since the input signal current is not taken directly into the operational impedance, but is led to an amplifier of high input impedance, the input impedance can be made extremely high, resulting in increasing the precision of mathematical operations.

3,579,132
CLASS "D" LINEAR AUDIO AMPLIFIER
James A. Ross, La Jolla, Calif., assignor to LTV Ling Altec Inc., Anaheim, Calif.
Filed Nov. 14, 1969, Ser. No. 876,771
Int. Cl. H03f *3/38*
U.S. Cl. 330—10 **14 Claims**

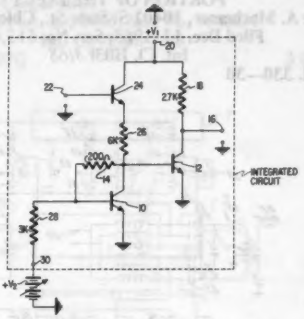




An audio frequency amplifier, useful to DC in which a pulse-width modulated signal is formed from the audio frequency signal. Each excursion of the pulse-width signal is cut in half with respect to time by an appropriately timed square-wave and plural logic gates. The resulting waveforms are passed without distortion by pulse transformers. Plural rectifiers and low-pass filters re-form the pulse-width modulated signal. This signal is impressed upon switching power transistors. These give a greatly amplified power output, which is the same type of amplitude-varying waveform as the input audio signal, upon the current flowing through a small choke to the load. The load may have any phase angle without incurring distortion of the output waveform. Half-bridge, quarter-bridge, full-bridge, and plural phase embodiments are described.

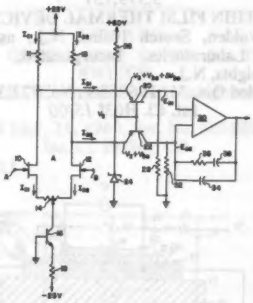
3,579,133
SIGNAL TRANSLATING STAGE
Jack R. Harford, Three Bridges, N.J., assignor to RCA Corporation
Filed Jan. 29, 1969, Ser. No. 794,973
Int. Cl. H03f *3/42*; H03g *3/30*
U.S. Cl. 330—19 **9 Claims**

A signal translating stage especially suited for fabrication using integrated circuit techniques including a first transistor, the transconductance of which is adjusted to effect a desired attenuation of applied input signals in response to a controllable direct voltage applied to an included second transistor,



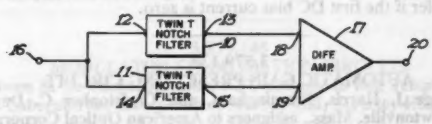
with the control voltage being applied in a manner to introduce a minimum of distortion in the attenuated signal over a wide control range.

3,579,134
SYSTEM FOR STABILIZING AN OPERATIONAL AMPLIFIER
Steven Morrison, Randallstown, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Oct. 17, 1969, Ser. No. 867,321
Int. Cl. H03f *5/00*
U.S. Cl. 330—3 **8 Claims**



Described is a system for direct current stabilizing an operational amplifier by means of a field effect common source differential amplifier with a current sink which drives a matched pair of PNP transistors in the common base configuration.

3,579,135
FILTER NETWORK AND METHOD
Robert K. Anderson, Minneapolis, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.
Filed Dec. 31, 1968, Ser. No. 788,238
Int. Cl. H03f *3/68*; H03h *7/10*
U.S. Cl. 330—30 **1 Claim**

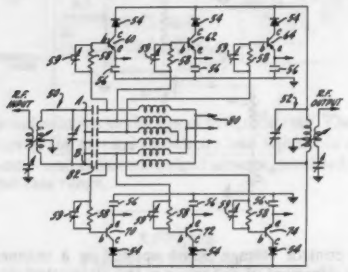


A filter network and method for the rejection of all but a selected band of frequency, the apparatus and method utilizing a pair of notch-type filters such as twin-T filters, with a common input connection and separate outputs connected to different inputs on a differential amplifier.

3,579,136
MULTI-STAGE POWER AMPLIFIER IN WHICH EACH STAGE CONDUCTS FOR ONLY A PREDETERMINED PORTION OF THE INPUT

George A. Machamer, 10401 S. State St., Chicago, Ill.

Filed Dec. 13, 1965, Ser. No. 513,405
Int. Cl. H03f *3/68*
U.S. Cl. 330—30 7 Claims

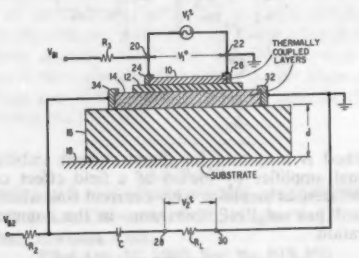


An amplifying circuit made up of a plurality of individual amplifying stages, each of which may have at least three elements. Each of the amplifying stages have a common input and a common output and the stages are so biased that each amplifying stage conducts for a different portion of the input cycle. Although the output wave form is the same as if only a single stage were used, by providing a plurality of stages, each of which conducts for only a portion of the input cycle, a substantially more efficient power amplifier is provided.

3,579,137
THIN FILM THERMAL DEVICE

Robert H. Walden, Scotch Plains, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Oct. 31, 1968, Ser. No. 772,335
Int. Cl. H03f *15/00*
U.S. Cl. 330—38 5 Claims



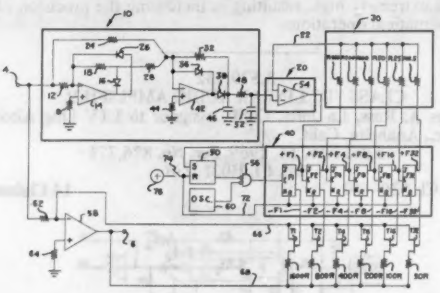
A thin film thermal device comprises an MIS structure fabricated on a low thermal conductivity insulator. A first DC bias and AC signal input are applied across the metal layer and a second DC bias is applied across, and the AC signal output taken from, the semiconductor layer. The device operates as an audio amplifier if the first DC bias current is greater than the second and operates as a frequency doubler if the first DC bias current is zero.

3,579,138
AUTOMATIC GAIN PRESETTING CIRCUIT

George J. Harris, Framingham, and Christopher C. Day, Newtonville, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Aug. 25, 1969, Ser. No. 852,635
Int. Cl. H03g *3/20*
U.S. Cl. 330—86 13 Claims

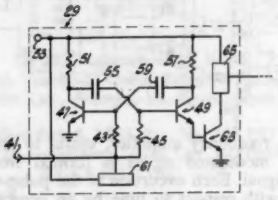
An automatic gain presetting circuit for adjusting the gain of an operational amplifier. A full-wave rectifier and peak detector determine the peak input. A counter is incremented continuously and a reference voltage is developed which increases with the increasing count. The reference voltage is compared with the detected peak voltage and when the reference voltage is equal to or greater than the peak input voltage the counter ceases to increment. A plurality of resistors are connectable in parallel in the feedback path of the operational amplifier, but each individual resistor is connected in the feedback path only if a respective stage in the counter is in a predetermined state. The gain of the operational amplifier depends upon the total effective feedback impedance. The larger the final count in the counter, corresponding to a larger peak input signal, the smaller the total effective feedback impedance and the lower the gain of the amplifier.



3,579,139
HORIZONTAL CIRCUITRY FOR TELEVISION RECEIVERS

Dong Woo Rhee, Williamsville, N.Y., assignor to Sylvania Electric Products Inc.

Filed Aug. 17, 1967, Ser. No. 661,388
Int. Cl. H04l *7/04*
U.S. Cl. 331—8 3 Claims



Transistorized horizontal oscillator and drive circuitry for a television receiver including a modified common emitter multivibrator with the emitter electrode of the multivibrator output transistor coupled directly to the base electrode of a drive transistor.

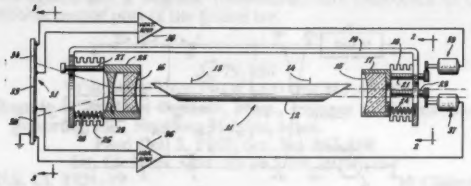
3,579,140
LASER

James M. Anderson, New Milford, and Marvin J. Fenton, Stamford, Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Dec. 5, 1967, Ser. No. 688,204
Int. Cl. G01b *11/26;* H01s *3/00*
U.S. Cl. 331—94.5 3 Claims

A continuous wave laser in which the end mirrors are automatically maintained in alignment. A four-quadrant detector is centered along the path of the emerging light beam. Misalignment of the end mirrors causes an axial shift in the direction of the light beam and produces output signals from

the four-quadrant detector from which can be determined the direction and amount of shift. These signals are used to



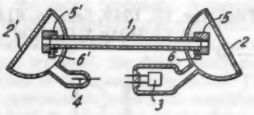
servocontrol the position of one of the mirrors so as to bring it back into alignment with the other mirror.

3,579,141

GAS LASER TUBE

Masao Miya, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed Jan. 30, 1969, Ser. No. 795,281
Claims priority, application Japan, Feb. 2, 1968, 43/6603
Int. Cl. H01s *3/22*
U.S. Cl. 331—94.5 **5 Claims**



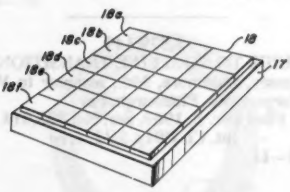
A gas laser device is described wherein a long life is obtained with the employment of a cathode and an anode. A gas filled tube is provided which at oppositely located ends has a cathode and an anode. A short hollow member, preferably of cylindrical shape, is seated on the ends of the gas filled tube. The member is made of a material selected to withstand the bombardment of discharge particles such as positive ions and electrons.

3,579,142

THIN FILM LASER

Vern N. Smiley, San Diego, Calif., assignor to the United States of America as represented by the Secretary of the Navy

Filed July 18, 1969, Ser. No. 842,938
Int. Cl. H01s *3/05*
U.S. Cl. 331—94.5 **11 Claims**



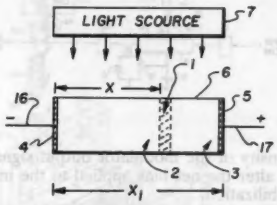
A laser assembly comprises a source of exciting or pumping energy, a thin film of laser material supported to intercept a path of the exciting energy, the film having a thickness of the order of one wavelength of the radiant energy emitted by the laser. The film is positioned at an angle relative to the exciting energy for producing a laser beam which is substantially perpendicular to the plane of the film and therefore a much larger aperture than had been realized with prior thin film lasing materials. In a preferred form, multilayer reflective coatings intensify and enchance the laser beam produced perpendicularly to the plane of the film.

3,579,143

METHOD FOR INCREASING THE EFFICIENCY OF LSA OSCILLATOR DEVICES BY UNIFORM ILLUMINATION

William H. Haydl, Tarzana, Calif., assignor to North American Rockwell Corporation

Filed Nov. 29, 1968, Ser. No. 780,037
Int. Cl. H03b *7/00*
U.S. Cl. 331—107G **3 Claims**



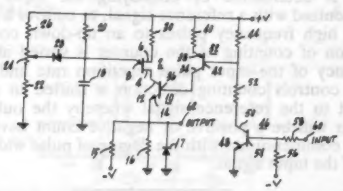
The frequency of oscillations can be controlled by applying uniform illumination to at least one surface of photoconducting semiconductors which exhibit a negative differential conductivity and traveling regions of space charge. The method is particularly useful in Gunn effect devices utilizing gallium arsenide (GaAs), but applies also to other photoconducting semiconductors exhibiting the Gunn effect and also to piezoelectric semiconductors exhibiting traveling domains due to acousto-electric interactions between acoustic waves and the charge carriers. Also described is a principle for reducing the fluctuations in the carrier density present in the crystalline semiconductor solid by reducing the inhomogeneities as a percentage of the total carrier density by uniformly illuminating the crystal. The reduction in the present fluctuations in the carrier density is of particular significance in gallium arsenide Gunn devices operating in the LSA mode.

3,579,144

RELAXATION OSCILLATOR SATED BY TRANSISTOR SWITCH

Michael Rotolo, Jr., Cherry Hill, N.J., assignor to RCA Corporation

Filed Mar. 19, 1969, Ser. No. 808,587
Int. Cl. H03k *3/26*
U.S. Cl. 331—111 **7 Claims**



A unijunction transistor, a switch such as the emitter-to-collector path of a bipolar transistor, connected with the emitter-to-base path of the unijunction transistor, and a charged capacitor connected across the series circuit. When the switch is closed, the capacitor instantaneously discharges through the emitter-to-base diode of the unijunction transistor. Thus, the leading edge of this discharge wave is substantially coincident in time with the closing of the switch, that is, with the turn-on pulse employed to drive the bipolar transistor into conduction.

3,579,145

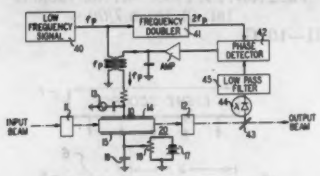
MODULATOR STABILIZATION CIRCUITS

Owen E. De Lange, Rumson, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Mar. 21, 1969, Ser. No. 809,261
Int. Cl. H01s *3/10;* **H03c** *1/06*
U.S. Cl. 332—7.51 **3 Claims**

The operating point of a modulator is stabilized by superimposing a pilot signal upon the information bearing

modulating signal. The resulting modulation produced by the pilot signal is compared with a reference signal in a phase detector and a control signal generated which is used to counteract any drift of the operating point. Alternatively, the



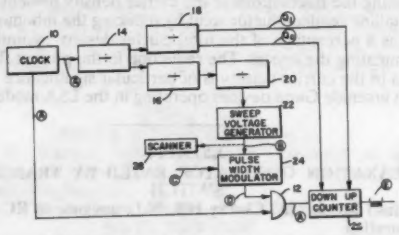
average intensity of the modulator output signal is detected and used to alter the net bias applied to the modulator as a means of stabilization.

3,579,146

DIGITAL MODULATOR AND DEMODULATOR

Thomas O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Murray F. Cohen, Roslyn Heights, N.Y.

Filed Dec. 31, 1969, Ser. No. 889,478
Int. Cl. H03k *7/08, 9/08*
U.S. Cl. 332—9R **10 Claims**



The modulation index of a pulse width modulated input signal is determined by employing the input signal, as synchronized with a reference signal, to control a gate which passes high frequency pulses to an up-down counter. The direction of counting of the counter is varied at twice the frequency of the input pulse repetition rate and the signal which controls counting direction is shifted in phase with respect to the reference signal whereby the output of the counter will be a positive or negative count having a magnitude commensurate with the degree of pulse width modulation of the input signal.

ERRATUM

For Class 332—19 see:
Patent No. 3,579,150

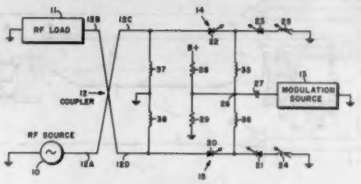
3,579,147

PHASE MODULATOR

Kenneth H. Brown, Phoenix, and Robert C. Fitting, Scottsdale, Ariz., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Jan. 8, 1969, Ser. No. 789,903
Int. Cl. H03c *3/12*
U.S. Cl. 332—29 **4 Claims**

A pair of tuned lines are coupled to a carrier signal source and a load through a quarter-wave coupler. The electrical length of the lines are electrically altered to phase modulate the carrier supplied by the source through the coupler to the load. Varactor diodes and a variable inductance in each of the lines vary the line electrical lengths such that there is a linear modulation of the carrier. The arrangement is such that the energy reflected from the two lines have phases opposing at the source such that there is no power supplied at the input coupler port while all of the reflected power from



the two lines is supplied in phase through the coupler output port to the load.

ERRATUM

For Class 332—302 see:
Patent No. 3,579,281

3,579,148

GRID DIRECTIONAL COUPLER FOR OVERSIZE CIRCULAR WAVEGUIDES

Alan E. Blume, Scotia, N.Y., assignor to General Electric Company

Filed Apr. 10, 1969, Ser. No. 814,993
Int. Cl. H01p *5/14, 1/00*
U.S. Cl. 333—10 **18 Claims**

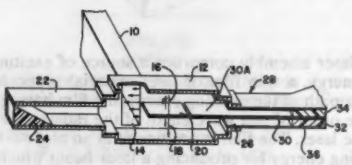
A directional coupler, for use in the propagation of microwave frequency electromagnetic energy, comprises a septum connected diagonally across a right angle junction of two circular waveguides. The septum is a metallic grid comprised of a plurality of substantially parallel electrical conductor of diameter much smaller than the wavelength of the propagated frequency, and the spacing between adjacent parallel conductors is also smaller than the propagation wavelength. The plurality of conductors may form a grid of equal size squares or a series of nested ellipses, and provide uniform complex reflection and transmission coefficients over the entire septum.

3,579,149

WAVEGUIDE TO STRIPLINE TRANSITION MEANS

Kurt G. Ramsey, Baltimore, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 8, 1969, Ser. No. 883,014
Int. Cl. H01p *5/12, 1/16*
U.S. Cl. 333—11 **5 Claims**



Described is apparatus for translating electromagnetic wave energy traveling in the TE_{10} mode in a rectangular

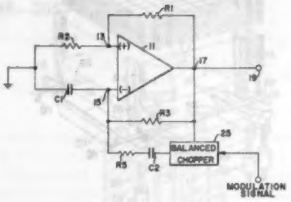
waveguide to the TEM mode in a stripline transmission line or vice versa. This is accomplished by means of an E-plane folded tee connection having an input port connected to a waveguide and a stripline transmission line connected to a double output port of the folded tee.

3,579,150

VOLTAGE CONTROLLED OSCILLATOR

Rosario S. Badessa, Dedham, Mass., assignor to Damon Engineering, Inc., Needham Heights, Mass.

Filed Oct. 3, 1969, Ser. No. 863,589
Int. Cl. H03c 3/08; H03b 5/20; H03f 1/34
U.S. Cl. 332—19 10 Claims



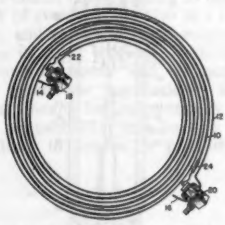
The oscillator disclosed herein employs a high gain differential amplifier of a type having a relatively low offset voltage between the input terminals. A positive feedback signal is applied to the noninverting input terminal of the amplifier and a delayed negative feedback signal is applied to the inverting input terminal, the delay being provided by a capacitor connected to the inverting terminal. This combination of feedback components causes the amplifier to oscillate at a frequency which is a function of the delay provided by the capacitor. The effective delay is then varied by means of an AC signal which is applied to the capacitor in synchronism with the amplifier output signal. The AC signal is obtained by means of a chopper which is synchronized or driven by the amplifier and which operates on a control or modulation signal provided to the oscillator. The amplitude of the AC signal applied to the capacitor will thus be proportional to the amplitude of the modulation signal. Accordingly, the frequency of oscillation is variable as a function of the modulation signal amplitude.

3,579,151

ACOUSTIC AND ELECTROMAGNETIC SHIELD AND MECHANICAL SUPPORT FOR ULTRASONIC STRIP DELAY LINE

David J. Whitney, Amherst, and Raymond R. Nepveu, Londonderry, N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Oct. 20, 1969, Ser. No. 867,755
Int. Cl. H03h 9/30
U.S. Cl. 333—30 6 Claims



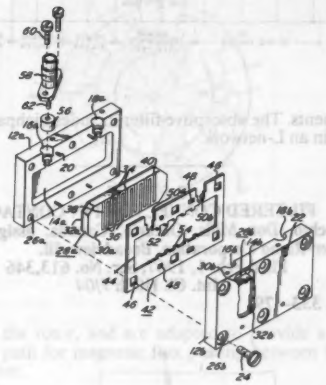
An ultrasonic strip delay line having its longitudinal edges covered with acoustic absorbing tape is coiled with a dummy shielding strip and placed between clamping plates. The dummy strip provides a mechanical stop which prevents distortion of the delay line as well as a grounded metal enclosure for electromagnetic and acoustic shielding of the delay line.

3,579,152

INTERDIGITAL STRIPLINE FILTER MEANS WITH THIN SHORTING SHIM

Michael Moore, Philadelphia, Pa., assignor to American Electronic Laboratories, Inc., Colmar, Pa.

Filed Sept. 5, 1968, Ser. No. 757,529
Int. Cl. H01p 3/08, 11/00; H03h 13/00
U.S. Cl. 333—73 10 Claims



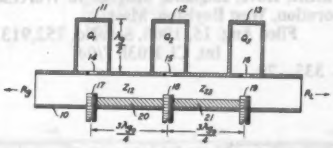
A stripline interdigital filter means in which the stripline ground planes are metal layers on the outer surfaces of a pair of mating sheets of an insulating material, the resonator strips and coupling strips of the filter are a printed circuit on the mating surfaces of one of the insulating sheets, and the shorting member of the filter is a thin metal shim having shorting tabs extending between the mating surfaces of the insulating sheets and clamped against the resonator strips.

3,579,153

MICROWAVE FILTER

Han-Chiu Wang, Salem, N.H., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Sept. 7, 1967, Ser. No. 666,013
Int. Cl. H03h 7/10
U.S. Cl. 333—73 6 Claims



A microwave bandstop filter of the type in which a plurality of resonant cavities are coupled by irises at intervals to a connecting waveguide. According to the invention the intervals are made three-quarters wavelength and the connecting guide section between each pair of irises is provided with a particularly chosen characteristic impedance which eliminates undesirable responses of the connecting sections without introducing further discontinuities to the structure.

3,579,154

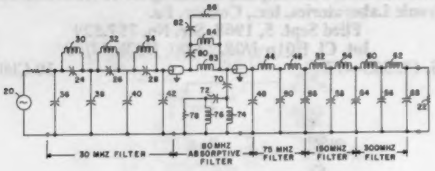
VHF FILTER HAVING ABSORPTIVE TUNED SECTION TO ELIMINATE NARROW SPURIOUS PASSBAND

Glen W. Deen, Richardson, Tex., assignor to Collins Radio Company, Dallas, Tex.

Filed Apr. 23, 1969, Ser. No. 818,590
Int. Cl. H03h 7/08
U.S. Cl. 333—76 11 Claims

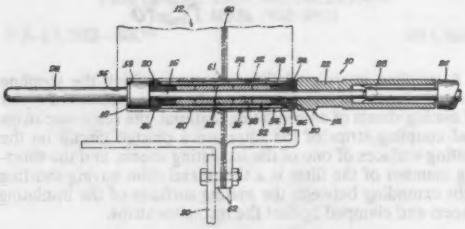
Disclosed is a very high frequency filter for use with a high frequency radio transmitter which prevents transmission of

harmonics. The filter includes an absorptive filter which eliminates spurious passbands resulting from interaction of



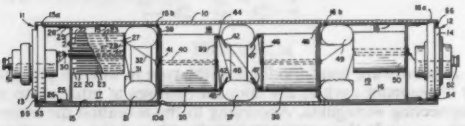
components. The absorptive filter includes highpass filters arranged in an L-network.

3,579,155
FILTERED CONNECTOR PIN CONTACT
Jeff Tuchto, Don Mills, Ontario, Canada, assignor to The Bunker-Ramo Corporation, Broadview, Ill.
Filed Feb. 1, 1967, Ser. No. 613,346
Int. Cl. H03h *7/04*
U.S. Cl. 333—79 **4 Claims**



Pin contact for filtered connector, having central metal element surrounded by a ferrite ferrule and an outer ceramic sleeve, and including flexible conductive washers end-loading the ferrule and sleeve, to provide flexibility, and prevent breaking.

3,579,156
SHIELDED FILTER
Peter Parfitt, Hove, England, assignor to Worcester Controls Corporation, West Boylston, Mass.
Filed Aug. 15, 1968, Ser. No. 752,913
Int. Cl. H03h *7/04*
U.S. Cl. 333—79 **10 Claims**

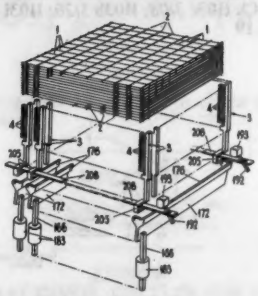


An electrical filter comprises an elongated metallic tube having a pair of open-ended cans inserted into the tube ends with the open ends of the cans being joined to the tube adjacent the tube ends. The interior regions of the tube, divided by the closed ends of the cans, contain inductance and capacitance elements electrically interconnected to one another, said interconnections including conductive tabs carried by the capacitance elements. The ends of the tube are hermetically sealed; and the interior of the tube is filled with a potting compound.

ERRATUM

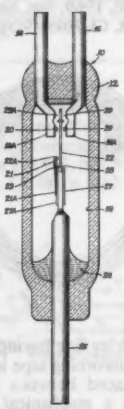
For Class 333—97 see:
Patent No. 3,579,282

3,579,157
ELECTRIC CROSSBAR SWITCHES
Donald Edward Rowley, Coventry, England, assignor to The General Electric and English Electric Companies Limited, London, England
Filed Nov. 7, 1969, Ser. No. 874,791
Claims priority, application Great Britain, Nov. 8, 1968, 53060/68
Int. Cl. H01h *67/14*
U.S. Cl. 335—112 **6 Claims**



A crossbar switch in which an array of contact sets is formed by a cross-wire matrix. The contact sets are operated by movement of respective 'interposer members' into the plane of the array. The interposer members are operated selectively by coordinate crossbar systems one of which moves a row of interposer members into driving positions underneath the respective contact sets and the other of which, crossing the first, drives the selected one of the positioned interposer members into operative engagement with the selected contact set. The interposer members are carried by, and magnetically located on, the bars of the first coordinate system so that operation of a bar of the first system does not disturb a previous connection made by the same bar, the magnetic coupling accommodating the relative movement of the interposer members.

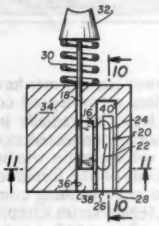
3,579,158
ARMATURE STRUCTURE FOR REED SWITCHES
John Kutyla, Chicago, Ill., assignor to C. P. Clare & Company, Chicago, Ill.
Filed July 28, 1969, Ser. No. 845,202
Int. Cl. H01h *51/28*
U.S. Cl. 335—151 **21 Claims**



A sealed switch with an elongated glass housing having pole pieces sealed in both ends includes a uniplanar, rigid ar-

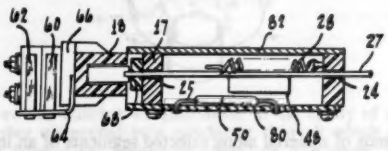
mature having a projecting or transversely extending end portion. A flat spring movably mounts said one end on one pole piece with the projection forming a working gap with this pole piece so that the armature has two working gaps and the switch has increased sensitivity. In one switch, a pair of pole pieces are sealed at one end of the housing with the free end of the armature disposed between the pair of pole pieces. In another switch, a single pole piece is provided at each end.

3,579,159
PUSHBUTTON MAGNETIC REED SWITCH
William T. Posey, 608 Knoll Road, Boonton, N.J.
Filed May 3, 1968, Ser. No. 726,391
Int. Cl. H05b *51/28*
U.S. Cl. 335—205 **7 Claims**



A novel reed switch assembly provided with a ceramic bar magnet as the switch actuating means is disclosed. The structure of the novel reed switch is characterized by the arrangement of the ceramic bar magnet with an iron backing plate.

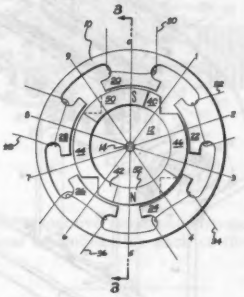
3,579,160
PUSHBUTTON MECHANISM
Harold Jessup Mackway, Haddon Heights, N.J., assignor to RCA Corporation
Division of Ser. No. 707,800, Feb. 23, 1968, Pat. No. 3,519,766. This application June 2, 1969, Ser. No. 829,530
Int. Cl. H01h *13/12, 13/52*
U.S. Cl. 335—206 **5 Claims**



Pushbutton switches of the type in which, in each bank, the depression of one button releases a previously depressed button. A printed circuit board leading to the electrical contacts of one bank of switches acts also as a sidewall for that bank of switches, and an electric and magnetic field shield member serves as its other sidewall. Additional features of these switches include simple and inexpensive one-piece plungers, simple means for automatically illuminating the depressed buttons, means for automatically electrically indicating whether a pushbutton in a bank is depressed, and means for resetting, in unison, a plurality of banks of switches.

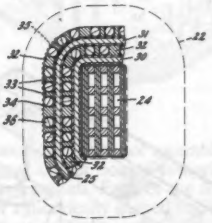
3,579,161
ELECTROMAGNETIC DEVICE
Sigmunt J. Kremzner, Pompton Plains, and William Pasechnick, Little Ferry, N.J., assignors to Singer-General Precision, Inc., Little Falls, N.J.
Filed Oct. 17, 1969, Ser. No. 867,148
Int. Cl. H01f *7/08*
U.S. Cl. 335—272 **2 Claims**

An electromagnetic device in which a rotor rotates within a stator in response to a plurality of electromagnets formed on the stator being selectively magnetized to cause attraction and repulsion with a north pole portion and a south pole portion of the rotor. Two or more spaced permeable bars are



carried by the rotor, and are adapted to provide a variable reluctance path for magnetic flux passing between the rotor and the stator.

3,579,162
WINDING DUCT CONSTRUCTION FOR POWER TRANSFORMER
Sudhir D. Savkar, Scotia, N.Y., assignor to General Electric Company
Filed Nov. 28, 1969, Ser. No. 880,619
Int. Cl. H01f *27/10*
U.S. Cl. 336—57 **8 Claims**

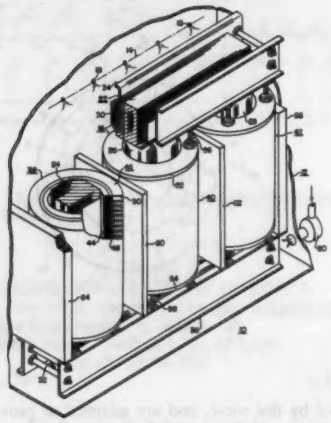


The ducts between adjacent layers of windings are formed into a plurality of longitudinal passageways of generally square cross section. A flat strip of insulating material twisted about the central longitudinal axis thereof is provided in each of the passageways to augment the heat flow from the winding to the coolant flowing in the passageway.

3,579,163
LIQUID-FILLED TRANSFORMER WITH FOAMED INSULATION
John C. Cronin, Horsham, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Sept. 24, 1969, Ser. No. 860,688
Int. Cl. H01f *27/02*
U.S. Cl. 336—94 **6 Claims**

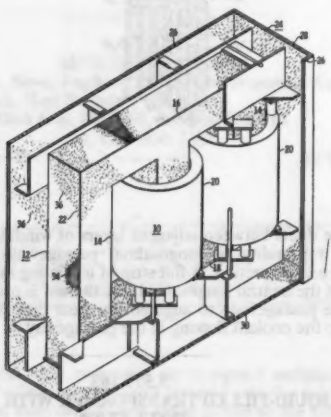
Electrical inductive apparatus of the type containing a magnetic core-winding assembly immersed in a liquid-insulating material. The breakdown voltage of predetermined insulating gaps in the apparatus is increased, while maintaining substantially the same dielectric constant across the gap as that of the liquid-insulating material, by disposing an open

cell-insulating foam material in the predetermined gaps. The open cells of the foam material are impregnated or filled with



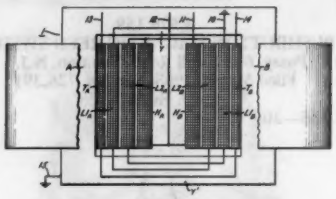
the liquid-insulating material, which increases the breakdown voltage in volts per mil across the gap.

3,579,164
NOISE REDUCTION SYSTEMS FOR ELECTRICAL TRANSFORMERS
James L. Rotruck, Sharon, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Nov. 14, 1969, Ser. No. 876,768
Int. Cl. H01f15/00
U.S. Cl. 336—100 **8 Claims**



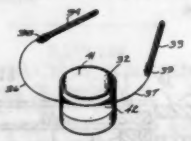
A system for reducing noise generated in an electrical transformer due to changing of size and shape of the ferromagnetic core when excited with alternating electric current. The noise reduction system comprises attaching flexible fibers to parts of the ferromagnetic core and parts of the housing or casing of the transformer. The flexible fibers absorb energy from the air column set up by the core when it changes size and shape and reduces the effectiveness of the air column in setting up objectional audible noise.

3,579,165
WINDING CONNECTION FOR SINGLE PHASE TWO LEG ELECTRIC TRANSFORMER
Wallace M. Johnson, Pittsfield, Mass., assignor to General Electric Company
Filed Sept. 24, 1969, Ser. No. 860,757
Int. Cl. H01f *27/28*
U.S. Cl. 336—170 **5 Claims**



A single phase power transformer having a low power tertiary winding comprises a two-legged core with four concentric coils on each leg. The radially innermost coils are of unequal turns and series connected to constitute the tertiary winding. The high voltage main winding comprises the two radially outermost coils of like formation connected in parallel. The low voltage main winding comprises two series coil circuits in parallel, each series circuit including a radially inner intermediate coil on one leg and a radially outer intermediate coil on the other leg, the radially intermediate coils on each leg having unequal numbers of turns.

3,579,166
ELECTRICAL COIL
Roderick V. Sawyer, Elkhart, Ind., assignor to CTS Corporation, Elkhart, Ind.
Filed Oct. 8, 1968, Ser. No. 765,791
Int. Cl. H01j *15/10*
U.S. Cl. 336—192 **5 Claims**

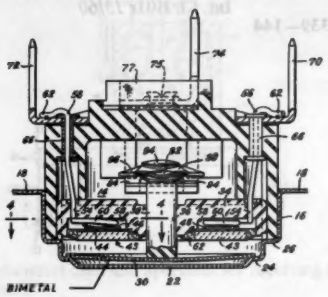


Strands of material along selected segments of an indeterminate length of stranded conductive material are welded together and severed to provide predetermined lengths of stranded conductive material having the strands at the ends thereof secured together to prevent unraveling. Such pieces of conductive material are secured to one or more coil lead wires to form a pair of terminal leads in a coil assembly. Each strand comprises a pliant fiber core about which is wrapped a conductive foil.

3,579,167
THERMOSTATIC SWITCH WITH IMPROVED HEATER ASSEMBLY AND METHOD OF ASSEMBLING SAME
Jack W. Grable, Lexington, Ky., assignor to Texas Instruments Incorporated, Dallas, Tex.
Continuation of application Ser. No. 566,674, July 20, 1966, now abandoned. This application Nov. 21, 1969, Ser. No. 872,446
Int. Cl. H01h *37/54, 37/64, 61/013*
U.S. Cl. 337—102 **4 Claims**

A thermostatically controlled electrical switch having a heater assembly adjacent the thermostatic element. The heater assembly includes ceramic substrate with a resistive coating on the face of the substrate remote from the thermostatic element. First and second spaced conductive contact

layers are provided on the resistive coatings. The resistive coatings are connected to exterior terminals via stiff spring

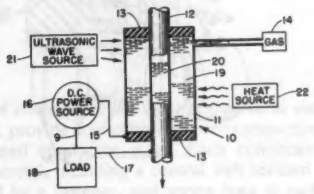


elements which have coiled end portions biased into firm electrical contact with the respective contact layers.

3,579,168
CYCLIC SWITCH

Alex Vary, North Olmsted, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Dec. 31, 1969, Ser. No. 889,387
Int. Cl. H01h *37/36, 87/00*
U.S. Cl. 337—114 **13 Claims**



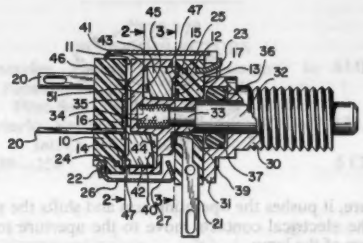
A switch utilizing a liquid metal in the cavity of a metal chamber connected in a conductor through which current flows from a DC source to a load or vice versa. Abrupt, cyclic decreases in current are effected by the formation of vapor films or vapor cavities which form at the interfaces between the liquid metal and the walls of the chamber due to ohmic heating. A source of pressurized gas communicates with the interior of the chamber. Cooling means for the chamber are provided to extract heat at a predetermined rate. The chamber may also be subjected to ultrasonic waves and heat waves to alter the wetting-dewetting action of the liquid metal.

3,579,169
A VARIABLE RESISTOR FOR DUAL OPERATION

Clarence R. Dickinson, Greendale, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Feb. 5, 1969, Ser. No. 796,686
Int. Cl. H01c *9/02*
U.S. Cl. 338—170 **7 Claims**

A variable resistor providing an integral assembly for dual operation comprising a pair of arcuate resistance track elements in axially spaced, face-to-face relationship and having interposed therebetween a single insulating rotor or brush carrier including oppositely facing cavities, each cavity being recessed relative to a central plane and adapted to individually receive conducting brush members. Biasing springs are provided for maintaining the brush members in electrical

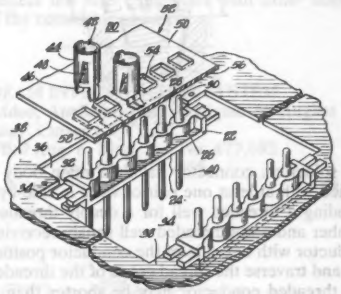


contact with the respective resistance elements, as well as individual terminal assemblies for each of the resistance elements.

3,579,170
MODULAR ELECTRICAL CONNECTOR ASSEMBLY

Bruno Baumanis, River Forest, and Robert W. Sebastian, Villa Park, Ill., assignors to Molex Incorporated, Downers Grove, Ill.

Filed May 20, 1968, Ser. No. 730,350
Int. Cl. H05k *1/00*
U.S. Cl. 339—17 **6 Claims**



A modular electrical connector assembly for making connections to printed circuit boards comprising a plurality of male and female terminals. Each of the female terminals includes a circular cylindrically shaped barrel portion having a plurality of resilient contact members integrally formed from the wall thereof and facing inwardly toward the center thereof, and a pair of tab members for insertion into an aperture in a printed circuit board wherein they are bent to secure the terminal thereon. The male terminals each includes at least one circular cylindrical contact end for insertion into either open end of the barrel portion of a female terminal. The male terminals may be used separately or mounted in spaced relation in an insulating terminal block, and may also have a solderless wrap or other type of connector end for making external connection thereto.

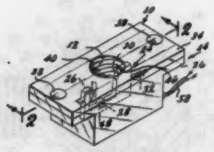
3,579,171
SAFETY SOCKET

Arthur S. Woodward, Sylmar, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Sept. 25, 1969, Ser. No. 860,973
Int. Cl. H01r *13/44, 33/08, 33/54*
U.S. Cl. 339—34 **10 Claims**

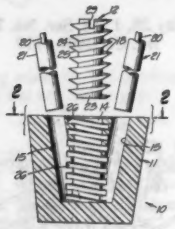
A socket for an ordinary incandescent lamp which prevents electrical shock if a child sticks his finger into it, comprising an aperture for receiving the base of a lamp and a shuttle which carries an operating arm and a pair of electrical

contacts. The shuttle is spring biased to a position wherein the arm lies within the aperture while the contacts are spaced from the aperture. However, when a lamp is screwed into the



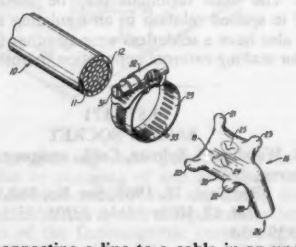
aperture, it pushes the operating arm and shifts the shuttle so that the electrical contacts move to the aperture to contact the base of the lamp.

3,579,172
SOLDERLESS CONNECTOR ASSEMBLY
Marvin A. Clark, 7902 Woodley Ave., Van Nuys, Calif.
Filed June 23, 1969, Ser. No. 835,443
Int. Cl. H01r *9/08, 7/08*
U.S. Cl. 339—97 **15 Claims**



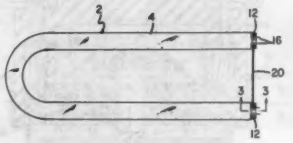
A solderless connector having a main body of insulation formed with at least one pair of wells in side-by-side relation including a threaded well for a deeply threaded conductive member and a nonthreaded well snugly receiving a sheathed conductor with one side of the conductor positioned to intersect and traverse the thread crests of the threaded conductor. The threaded conductor may be shorter than the threaded well or it may have a protruding outer end usable as a terminal lug or as the male end of a service cord plug.

3,579,173
UNDERGROUND CABLE TAP CONNECTOR
Richard G. Greener, Poughkeepsie, N.Y., assignor to Fargo Mfg. Company, Inc., Poughkeepsie, N.Y.
Filed Dec. 23, 1969, Ser. No. 887,652
Int. Cl. H01r *7/04*
U.S. Cl. 339—97R **7 Claims**



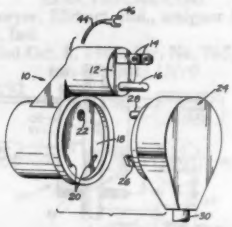
A tap for connecting a line to a cable in an underground application without removing the insulation from the cable and which will provide a moistureproof seal at the point of connection of the tap to the cable.

3,579,174
LAMP-BASE ASSEMBLY
Marcellus N. Gilbert, Jr., Lynnfield, Mass., assignor to Sylvania Electric Products, Inc.
Filed June 24, 1968, Ser. No. 739,438
Int. Cl. H01r *13/60*
U.S. Cl. 339—144 **4 Claims**



A lamp-base assembly for a tubular lamp bent into a U-shaped configuration in which the bases on the ends of the lamp are connected to one another by a rod.

3,579,175
ELECTRIC CIRCUIT ADAPTER MEMBER
Larry L. Shroyer, Kendallville, Ind., assignor to Lyall Electric, Inc., Albion, Ind.
Filed Aug. 13, 1969, Ser. No. 849,645
Int. Cl. H01r *13/50*
U.S. Cl. 339—156 **5 Claims**

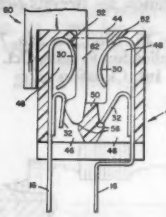


The invention relates to an adapter member having a body of electrical insulating material with elements of a male fitting projecting therefrom to permit the adapter to be plugged into a receptacle. The body has elements of a female fitting therein adapted for receiving the male fitting on the end of an electric cable. The female fitting portion of the body may receive a larger male plug than can be received in the receptacle, or a male plug of a different character than can be received in the receptacle. The male fitting portion and female fitting portion of the adapter preferably have their axes parallel and offset so that the female fitting portion can be disposed below the male fitting portion and thereby reduce the load on the receptacle.

3,579,176
MICROMINIATURE PRINTED CIRCUIT CONNECTOR
Michael Bokor, Huntington Beach, and Norbert L. Moulin, Placentia, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.
Filed Mar. 3, 1969, Ser. No. 803,896
Int. Cl. H01r *13/64, 13/24*
U.S. Cl. 339—176 **3 Claims**

A connector comprising a connector block with contact elements mounted therein for contacting the leads of a printed-circuit card. The contact elements have tabs for posi-

tioning and locking the contact elements in the connector block. The connector block includes an aperture for receiving a printed-circuit card and apertures for receiving the contact elements.



3,579,177

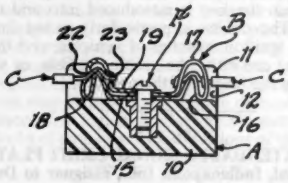
TERMINAL BOARD ELECTRICAL CONNECTOR

Robert E. Lawlor, Costa Mesa, Calif., assignor to Electro-Clamp Corporation, Beverly Hills, Calif.

Continuation-in-part of application Ser. No. 702,411, Feb. 1, 1968, now Patent No. 3,477,060. This application Aug. 21, 1969, Ser. No. 852,060

Int. Cl. H01r *7/06*

U.S. Cl. 339—198 **2 Claims**



A plurality of connectors, mounted in transverse slots in a terminal board, provide connections between respective pairs of axially aligned conductor wires. Each connector is of resilient sheet metal, including a central web secured to the terminal board by a fastener, and spring jaws at each end, each having means for clamping a respective wire end.

ERRATUM

For Class 339—217 see:
Patent No. 3,579,283

3,579,178

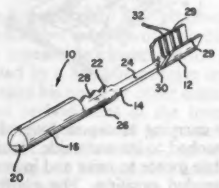
ELECTRICAL TERMINAL AND HOUSING THEREFORE

Allen Edwin Travis, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 4, 1969, Ser. No. 882,069

Int. Cl. H01r *9/08*

U.S. Cl. 339—221 **3 Claims**



The disclosure relates to terminals for terminating the lead ends of a coil winding and includes provisions for securing the terminals within apertures located in flanges integral with a coil bobbin with a portion of the terminals extending from the flange for plugging into mating receptacles.

3,579,179

FUSE CONNECTORS

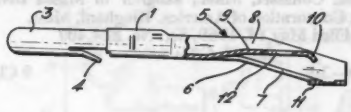
Daniel Dumeige, Pontoise, France, assignor to AMP de France, Pontoise, France

Filed Sept. 23, 1968, Ser. No. 761,473

Claims priority, application France, Sept. 27, 1967, 122,483

Int. Cl. H01r *11/22*; **H01h** *85/22*

U.S. Cl. 339—258 **5 Claims**



A fuse connector has a fuse contact formed from sheet metal with a body having an apertured extension, a resilient tongue in the aperture engaging an end of a fuse cartridge, side portions along the aperture embracing sides of the cartridge, and a bar joining the side portions serves to limit deflection of the tongue. A housing houses the fuse connectors to provide a connector assembly and it has hinged cover means for access to the fuse; commoning strips may be employed to connect the fuse connectors with other selected connectors of the connector assembly.

3,579,180

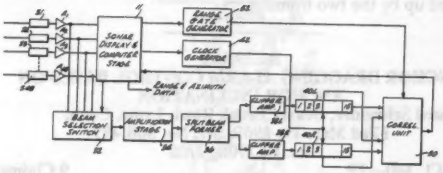
BEAM INTERPOLATING SYSTEM

Fausto V. Taddeo, Anaheim, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 6, 1965, Ser. No. 477,682

Int. Cl. G01s *9/66*

U.S. Cl. 340—3 **14 Claims**

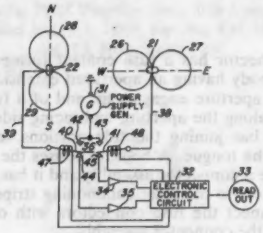


CLAIM 1. In a sonar receiving system including means for effectively forming a plurality of receiving beams, each beam representable by a composite signal comprising signals received from another azimuth range the effective centerline of each beam having an azimuth in the center of said azimuth range, said sonar receiving system further including processing and computing means for processing each composite signal to detect the range of a target having an azimuth within the azimuth range of one of said beams, an improved system for interpolating the composite signal in which a target has been detected to resolve the azimuth of the target with respect to the azimuth of the centerline of said beam comprising: means for splitting a composite signal representative of a receiving beam in which a target has been detected into a pair of signals representative of a pair of beams which are parallel to said centerline and equidistantly disposed with respect thereto; a pair of multibit delay lines, coupled to receive said pair of signals;

a plurality of analog storing units, each unit, corresponding to a different azimuth deviation with respect to the azimuth of said centerline, being coupled to two bits of said pair of delay lines; means for integrating in each of said storing units analog signals as a function of the phase correlation of signals

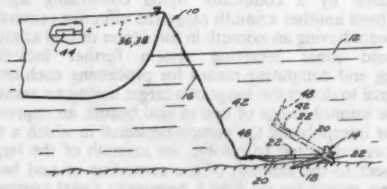
in two different bits of said pair of delay means, the two bits having signals exhibiting a maximum phase correlation being related to the azimuth deviation of said target from the azimuth of said centerline; means for scanning said plurality of storing units to detect the unit coupled to the two bits having signals which exhibit a maximum of phase correlation; and means for providing as a function of the detected unit an output signal which indicates the azimuth deviation of the target from the azimuth of said centerline.

3,579,181
SONAR RANGING SYSTEM FOR LOCATING SUBMERGED OBJECTS
Frank Massa, Cohasset, Mass., assignor to Massa Division Dynamics Corporation of America, Hingham, Mass.
Filed May 14, 1969, Ser. No. 824,407
Int. Cl. G01s *9/66*
U.S. Cl. 340—3-R **9 Claims**



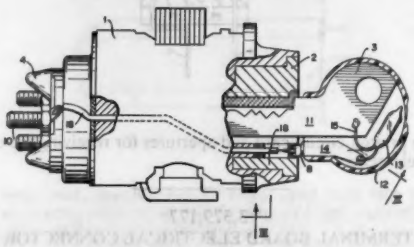
A pair of narrow-beam directional transducers are mechanically joined together to radiate sonic energy in angular directions which are fixed with respect to each other. Electrical switching means cause the individual transducers to sequentially radiate bursts of sonic energy. Each of the transducers picks up the reflected sonic energy, and electronic means ascertains the azimuth of the object reflecting the energy, responsive to the relative strength of the signals picked up by the two transducers.

3,579,182
ANCHOR DRAGGING ALARM CONTROL BASED ON ANCHOR INCLINATION
Leonard Schneider, Beaver Brook Road, Lyme, Conn.
Filed Mar. 19, 1969, Ser. No. 808,487
Int. Cl. G08g *3/00*
U.S. Cl. 340—29 **9 Claims**



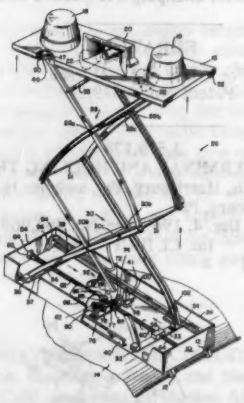
An inclination-sensitive switch is operatively secured to a part of an anchor. The switch is open when the part is oriented such that the anchor grabs the bottom. When the orientation of the anchor part exceeds the horizontal by a predetermined value, corresponding to that orientation when the anchor is freed from the bottom, that switch is closed to actuate an alarm.

3,579,183
SIGNALLING DEVICE TO PREVENT LEAVING A KEY IN A LOCK
Paul Lipschutz, Croissy sur Seine (Yvelines), France, assignor to Societe d'Exploitation des Brevets Neiman S. A., Neuilly-Seine, France
Filed July 25, 1968, Ser. No. 747,670
Claims priority, application France, Oct. 6, 1967, 123,557
Int. Cl. B60q *1/26*
U.S. Cl. 340—52 **8 Claims**



A signalling device to prevent leaving a key in a lock. The device includes a lock which has a number of different positions and a key coacting with the lock to displace it between these positions. An electromechanical means coacts with the key and lock to give a warning signal when the key places the lock in at least one of its positions, such as the position which the lock has when the key is introduced into and removed from the lock. The device is particularly suited for use in connection with ignition switches of vehicles, and the signal which is provided can either be visible, audible, or vibratory so as to be felt by the fingers of the operator.

3,579,184
PORTABLE EXTENDABLE SIGNAL LIGHT PLATFORM
Robert J. Forestal, Indianapolis, Ind., assignor to Dura Corporation, Southfield, Mich.
Filed Apr. 11, 1969, Ser. No. 815,301
Int. Cl. G08b *5/36, 3/00*
U.S. Cl. 340—137 **12 Claims**

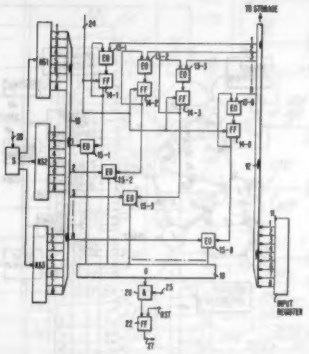


A platform for carrying emergency signals having a lazy-tong structure attached to its underside. Said structure is actuable by an electric motor to raise and lower the platform to and from an extended position. The platform serves as a cover for a cabinet which houses the motor and the retracted lazy-tong structure, said cabinet being mountable on the roof of an emergency vehicle.

3,579,185
METHOD AND APPARATUS FOR CHECKING A DATA TRANSFER OPERATION

Wilhelm Spruth, Sindelfingen, Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 20, 1968, Ser. No. 761,186
Claims priority, application Germany, Sept. 27, 1967, P1549484.5
Int. Cl. H04l *1/10*
U.S. Cl. 340—146.1 12 Claims

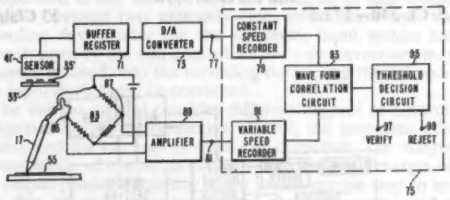


The accuracy of a data transfer operation, particularly one which involves loading a micro program into an alterable control storage device for use in a data processing system, is verified by deriving a check number from the transferred data and comparing the desired check number with a predetermined check number known to be correct. A variety of concepts may be used to obtain the derived check number such as successive logical Exclusive OR operations on transferred blocks of data or selected portions of the blocks.

3,579,186
PERSONAL IDENTIFICATION METHOD AND APPARATUS

Robert R. Johnson, Franklin, and Richard L. Dunham, Bloomfield Hills, Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed June 25, 1968, Ser. No. 739,803
Int. Cl. G06k *5/00*
U.S. Cl. 340—146.3 18 Claims

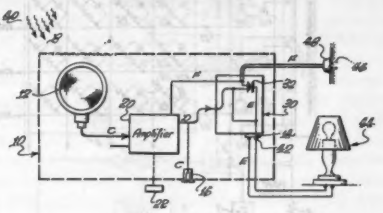


A method and apparatus for positively determining whether an individual is a member of a predetermined group based on unique repeatable characteristics of an electrical waveform generated by a force-responsive transducer whenever the person writes his name or other mark. In accordance with the preferred embodiment of the invention disclosed herein, positive identification of a person as being an authorized member of a predetermined group is made by an apparatus which compares prerecorded authorized signature characterizing information with an electrical waveform generated when the person signs his signature. The comparison may for example comprise a cross or autocorrelation technique in which the identifying apparatus determines whether the waveform generated by the person in signing his signature correlates within a predetermined degree with the previously recorded signature identifying information.

3,579,187
MUSIC RESPONSIVE LIGHT POWER CURRENT SWITCHING DEVICE

Robert L. Knott, 10406 Leolang Ave., Sunland, Calif., and Donald H. Hadel, 7424 Forbes Ave., Van Nuys, Calif.

Filed Sept. 26, 1967, Ser. No. 670,599
Int. Cl. G08b *5/22*
U.S. Cl. 340—148 10 Claims

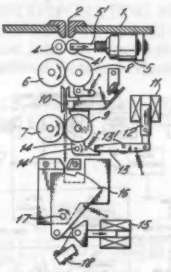


A music responsive light switching device comprising a music signal pickup which is connected to a control means which regulates the output of a power signal. The regulated power signal is applied to an electrical socket receptacle into which a conventional lamp is electrically plugged. The lamp can then be turned on and off in accordance with the characteristic rhythm of the music.

3,579,188
AUTOMATIC TICKET GATE

Keisuke Osaki, Kyoto, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Feb. 5, 1968, Ser. No. 703,074
Claims priority, application Japan, Feb. 6, 1967, 42-7532
Int. Cl. G07f *7/00*
U.S. Cl. 340—149 12 Claims



This invention comprises an automatic ticket gate which permits a passenger to pass therethrough only when the ticket he inserted into the slot of the gate for examination of its validity has been recognized as valid. A passenger is prevented from passing through until the ticket is removed from the slot in the gate, even when the ticket is recognized as valid.

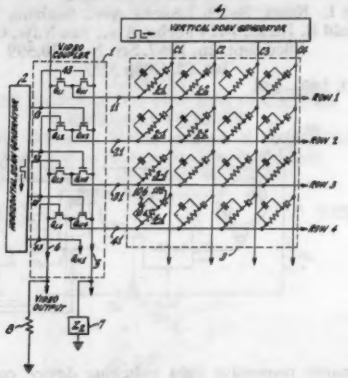
3,579,189
COUPLING AND DRIVING CIRCUIT FOR MATRIX ARRAY

Paul K. Weimer, Princeton, N.J., assignor to RCA Corporation

Filed Dec. 13, 1968, Ser. No. 783,591
Int. Cl. H04q *3/00*
U.S. Cl. 340—166 7 Claims

A coupling circuit comprising N stages connected in parallel between two conductors. Each stage comprises the con-

duction paths, in series, of two field effect transistors and an output terminal at the connection of the two paths. The output terminals are connected to the respective rows of an array of light sensing circuits. One transistor of one stage is turned on to connect one row of circuits through one conductor to an output circuit to permit the circuits of that row to be read out, in sequence. Concurrently, the other transistor of the following stage is turned on to connect the following row of circuits through the second conductor to ground to permit the circuits of the following row to be precharged. The process is continued until all rows of the matrix are successively precharged and read out.

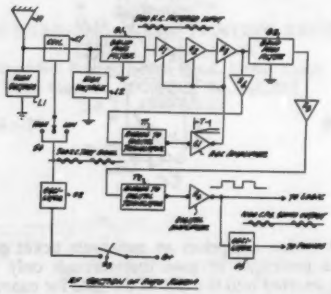


3,579,190

AUTOMATIC ALARM DETECTOR

Ernest C. Karras, Chicago, Ill., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 5, 1967, Ser. No. 636,446
Int. Cl. H04q 9/00
U.S. Cl. 340—167 **4 Claims**



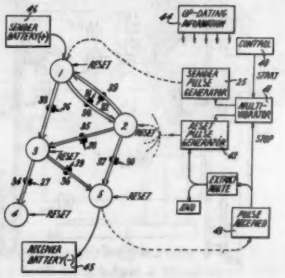
A system is provided for unattended monitoring of international distress signals. The system employs an RF section which responds to all the signals in the frequency range of interest. The RF signals are fed through two analog-to-digital translators; one of which supplies a control signal to automatic gain control equipment to control amplification in the RF section and the other of which supplies DC pulses according to the intelligence in the original RF signals. The DC pulses are employed by logic circuits which provide an output signal if (1) at least 4 consecutive pulses are present, (2) the pulses are of duration between 3.5 seconds and 6 seconds, and (3) the pulses are separated by time intervals of between 10 milliseconds and 1.5 seconds duration.

3,579,191

NETWORK USING ADAPTIVE ELEMENTS

John Hugh Andreae, Christchurch, New Zealand; Brian Ronald Gaines, Cambridge, and Peter White, Bishop's Stortford, England, assignors to International Standard Electric Corporation

Filed Oct. 27, 1967, Ser. No. 678,589
Claims priority, application Great Britain, Oct. 31, 1966, 48616/66
Int. Cl. G06f 15/18, 15/56
U.S. Cl. 340—172.5 **10 Claims**



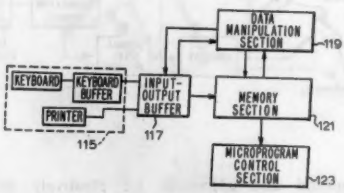
A communication network is provided using information storage control means for selecting a direct path from calling to called portions of the network. The network contains nodes and links therebetween. Each of the links has a switch controlled by an adaptive element therein. The adaptive element includes means for controlling the probability that a signal which emanates from the node traverses the link containing the adaptive element. Means operated in cooperation with the adaptive element are further provided so that any node which receives and passes on a signal is inhibited from receiving a further signal without first being reset.

3,579,192

DATA PROCESSING MACHINE

David Rasche, Bloomfield Hills, Mich.; Bernardo N. Levy, Livingston, N.J.; Bruce L. Ayres, Southfield; Hoy Ying Chang, Westland; Cornelius C. Perkins, and William W. Phillips, Birmingham, Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 2, 1967, Ser. No. 680,184
Int. Cl. G06f 9/16
U.S. Cl. 340—172.5 **23 Claims**

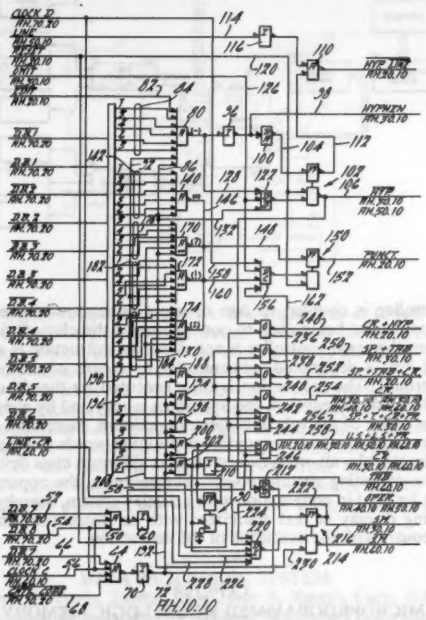


An improved digital computer having a limited number of hardware elements which can be used to perform varied logical processes on data under the control of macroinstructions, each macroinstruction being implemented through a series of stored microinstructions forming a stored microprogram, each microinstruction corresponding to a control signal for actuating a hardware element in the computer, a series of said microinstructions being used to implement the hardware elements in varied sequences in order to perform different logical processes.

3,579,193
EDITING AND REVISION SYSTEM

Donald R. Bernier, Lake Orion, Mich., assignor to Intercontinental Systems, Inc., Los Angeles, Calif.

Filed May 20, 1968, Ser. No. 730,477
Int. Cl. G06f 3/00
U.S. Cl. 340—172.5 46 Claims



An electronic system for editing and controlling the format of information reproduced on a sheet of paper or other recording device from an automatic input system. The edit control system may be divided into two of the parts, the first of which is the edit control portion and the second is the margin control portion. The edit control portion enables the user to automatically stop the input device after a plurality of preselected information groups have been sensed, as for example a character, a word, a line, a sentence, or a paragraph. The particular group to stop the system is selected by actuating the desired mode switch. This portion of the system may be operated in any one of the print, nonprint or skip modes and the operator may manually enter information onto the recording device after the the automatic input system has been stopped by the edit control. In this way corrections may be easily entered onto the recording device and the information input device may be corrected.

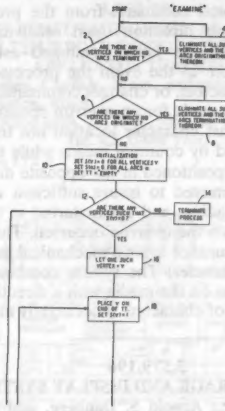
The margin control provides different degrees of control, designated herein as the margin control, the automatic edit control and the tab control modes of operation. The margin control mode of operation controls the right-hand margin of the output printer according to the preset margin stop to insure that information is not printed on the paper beyond a preselected extension of the margin stop, irrespective of the length of the information group being recorded. This preselected extension is designated the right-hand margin zone and is adapted to cause preselected automatic operations of the automatic input device. The automatic edit mode is utilized to specifically control the data printed in the right-hand margin zone to permit the operator to manually control the amount of data printed in the right-hand margin zone.

The tab control mode controls the left side margin or the number of tabs starting from the left-hand margin for a given data group. With the system in the margin and tab control modes, the system counts and stores the number of tabs on the first line of the data group, and generates the same number of tabs after a carrier return is acted upon. This stored number of tabs is skipped from the reader after the first line in the data group.

3,579,194
PROCESS FOR DETERMINING THE SIMPLE CYCLES OF A FINITE DIRECTED GRAPH

Herbert B. Weinblatt, Cambridge, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Sept. 4, 1968, Ser. No. 757,315
Int. Cl. G06f 7/00
U.S. Cl. 340—172.5 8 Claims

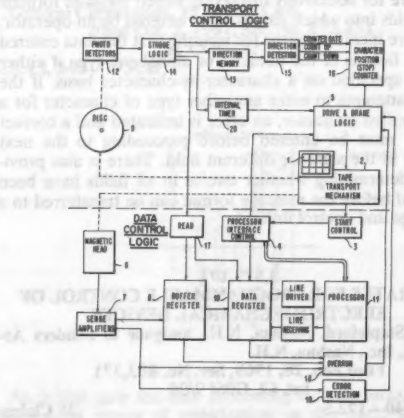


A machine process based on an algorithm for finding the simple cycles of a finite directed graph wherein each arc of the graph is examined once and only once. Simple cycles are found either when the path of the graph being examined is found to be cyclic or when parts of previously found cycles can be combined with a portion of the path then being examined to form cycles. A general purpose computer program for implementing the algorithm is described.

3,579,195
DATA SYSTEM INCORPORATING METHOD AND APPARATUS FOR REFERENCING MEDIA LOCATIONS

T. Milton Hallmark, and John M. Woodward, Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 5, 1968, Ser. No. 773,471
Int. Cl. G06f 13/04
U.S. Cl. 340—172.5 50 Claims



The invention concerns a data processing system that includes methods and apparatus for establishing accurate

referencing of data locations on a storage media, such as a magnetic tape record media. The system includes a central processor interconnected with a magnetic tape unit having character registers therein and normally operable under command from the processor to read a tape media at relatively high speeds, the data so derived being supplied through the registers to the processor for additional processing. The magnetic tape unit drive is coupled to a disc and photodetection means that supplies coded indications of data locations on the media. The tape unit is operable in a forward direction upon receiving a Read command from the processor and operable in a reverse direction upon receiving a Write-Backspace command, the latter command establishing a pseudowrite operation. In the event the processor does not accept the data characters, or changes commands, or detects an error, provision is made for an overrun operation. During this operation, the last character location not transferred is accurately referenced by counting means while the media is brought to a stop, repositioned in the opposite direction to a point sufficiently removed to insure sufficient acceleration for accurate data reading, and again started in the selected direction during which the overrun occurred. The system inherently provides insurance against mechanical jitter or other mechanical inconsistencies. The system combines counting of character locations on the media with a direction memory to insure that access of characters is accurately maintained.

3,579,196

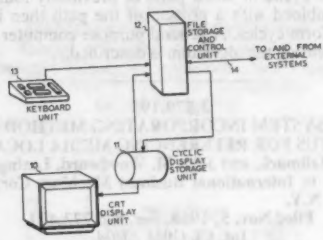
DATA STORAGE AND DISPLAY SYSTEM

Roland S. Gregg, Jr.; Arnold S. Danberg, and Kenneth N. Larson, Canoga Park, Calif., assignors to The Bunker-Ramo Corporation, Canoga Park, Calif.

Filed Feb. 14, 1969, Ser. No. 799,274

Int. Cl. G11b *13/00*

U.S. Cl. 340—172.5 **14 Claims**



A data storage and display system is provided with a control feature for selectively displaying stored message formats having fields into which data is to be entered by an operator. The feature includes means for insuring that the data entered into each field is of the numeric or alphabetic type if either has been specified on a character-by-character basis. If the operator attempts to enter any other type of character for a given specified character, an error is indicated and a correct character must be entered before proceeding to the next character in the same or different field. There is also provision for determining whether entries in all fields have been completed before the message format can be transferred to a file storage and control unit.

3,579,197

APPARATUS FOR PROGRAMMABLE CONTROL OF ELECTROMECHANICAL DEVICES

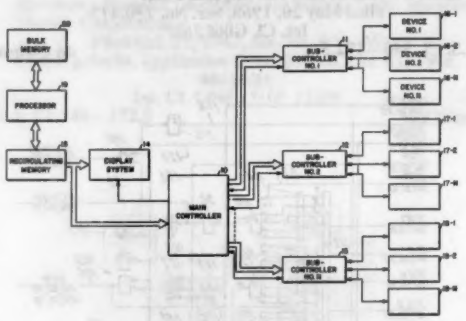
Gary N. Stapleford, Nashua, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Feb. 28, 1969, Ser. No. 803,371

Int. Cl. G06f *9/00*

U.S. Cl. 340—172.5 **35 Claims**

Instructions having a simple format are sued to control several classes of electromechanical devices such as slide projectors, tape recorders, movie projectors, X–Y positioning devices, etc. The instructions are stored in a recirculating memory and are monitored by a main controller. The main



controller is coupled to one or more subcontrollers, each subcontroller being used to control one of the class devices. When the main controller is activated, an instruction is enabled into a designated subcontroller by means of the main controller. The instruction is then executed by the subcontroller. After execution, the apparatus is recycled by a signal from either of the subcontrollers. In addition, more than one subcontroller may be executing instruction words simultaneously, thereby allowing two or or more different class devices to be operating simultaneously. Furthermore, the apparatus may be used in conjunction with a display system, thereby allowing display of text associated with an instruction simultaneously with the execution of the instruction.

3,579,198

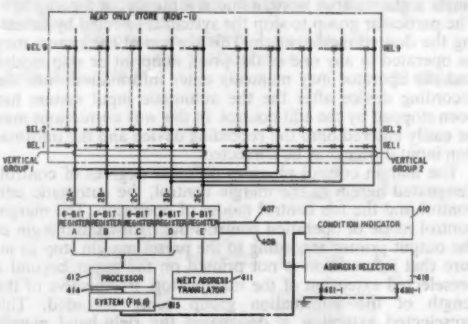
MICROPROGRAMMED WIRED LOGIC MEMORY

John A. Giunta, Long Branch, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Mar. 28, 1969, Ser. No. 811,440

Int. Cl. G06f *9/14*

U.S. Cl. 340—172.5 **11 Claims**

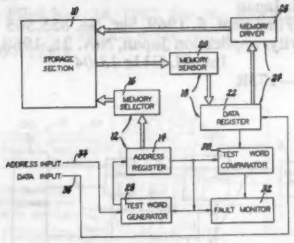


A microprogrammed logic system containing a crossbar switch read-only-store is arranged to control small electromechanical switching networks. The crossbar switch has a discrete voltage potential on each crosspoint representing, in binary format, either a "O" or a "1". Each horizontal row of the switch corresponds to the memory address of one instruction and upon selection enables the operating of a group of hold magnets thereby closing a predetermined number of crosspoints. Upon crosspoint closure, an instruction, containing as many binary bits as there are closed crosspoints, is available for use by the microprogrammed logic system.

3,579,199
METHOD AND APPARATUS FOR FAULT TESTING A DIGITAL COMPUTER MEMORY

Robert A. Anderson; Alfred H. Faulkner, Santa Barbara, Calif., and Edwin L. Hughes, Brookfield, Wis., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 3, 1969, Ser. No. 795,938
Int. Cl. G06f *11/04*
U.S. Cl. 340—172.5 8 Claims

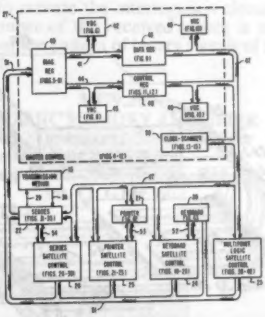


A digital computer memory is interrogated so as to test its operation. A digital word generator addresses the computer memory with a plurality of test address words identical to a plurality of test data words stored within word storage locations accessed by the test address words. The data words collectively include all coefficients of all powers of the radix of the numerical address code utilized by the digital computer. A digital word comparator detects any noncorrespondence between the test data words retrieved from the accessed word storage locations and the test address words thereby to indicate the presence of a fault within the computer memory.

3,579,200
DATA PROCESSING SYSTEM

Robert H. Davis, Raleigh, and Jerry S. Harris, Cary, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 30, 1969, Ser. No. 846,011
Int. Cl. G06f *11/08*; H04l *1/00*
U.S. Cl. 340—172.5 45 Claims

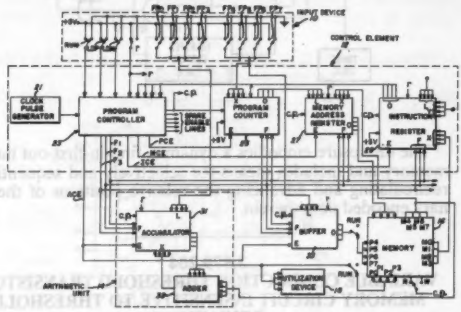


A data processing system including a plurality of terminals connected to a transmission medium for sending and receiving data and control signals between terminals is provided, and each terminal includes a master control connected by bus means having data lines and control lines to a plurality of satellite controls and input-output devices. A first parity checking device checks the parity of the signals on the control lines from each satellite to the master control, and a second parity checking device checks the parity of the signals on the control lines from the master control to the satellite controls. Even or odd parity may be used, but odd parity is preferred. Each satellite control includes a plurality of circuits interconnected to perform the control function of such satellite control, and each one of the plurality of circuits has an output line connected to an odd number of other such circuits, whereby a malfunction in any one of said plurality of circuits affects an odd number of control lines from such satellite control which thereby forces the first parity checking device to detect a malfunction. Each satellite control, for the odd parity case, supplies a control signal on a single given control line when it is not active, whereby the first parity checking device checks the status of each satellite control during both the active and the inactive states.

3,579,201
METHOD OF PERFORMING DIGITAL COMPUTATIONS USING MULTIPURPOSE INTEGRATED CIRCUITS AND APPARATUS THEREFOR

Frank J. Langley, Carlisle, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Sept. 29, 1969, Ser. No. 861,750
Int. Cl. G06f *1/00*
U.S. Cl. 340—172.5 5 Claims

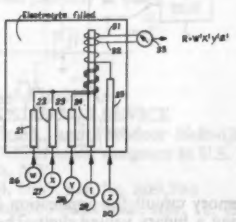


A digital computer, exemplifying a method of organizing and controlling the elements of a general or special purpose computer, incorporating identical multipurpose integrated circuits in the control and/or arithmetic elements, each one of such circuits being responsive to the combination of commonly applied clock pulses and coded function signals and a unique enable signal. With such an arrangement, a basic design of such control and/or arithmetic elements may be changed to expand word length, memory capacity or instruction repertoire by connecting similar multipurpose integrated circuits to existing ones as required.

3,579,202
ELECTROCHEMICAL INHIBIT GATE

Robert M. Stewart, Encino, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

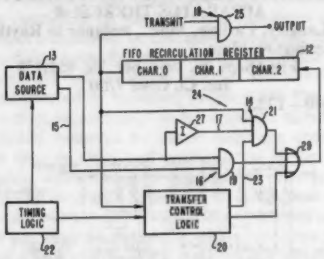
Filed Oct. 2, 1967, Ser. No. 673,252
Int. Cl. G11c *13/02*
U.S. Cl. 340—173CH 7 Claims



An inhibit gate for data processing systems utilizing electrochemical waves of polarization as the basic signalling mechanism employing a pair of electrodes immersed in an electrolyte is disclosed. The inhibit gate employs preferably

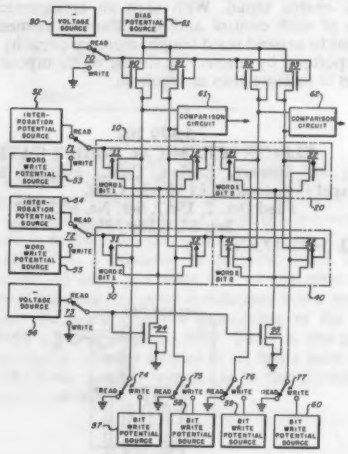
iron and gold as the active materials in an electrolyte of nitric acid. Inhibit operation is achieved by the particular composition, size and placement of two electrodes. In one form, the inhibit gate exhibits adaptive properties.

3,579,203
RECIRCULATING BUFFER MEMORY
Michael M. Malmer, Jr., Livonia, Mich., assignor to Burroughs Corporation, Detroit, Mich.
Filed Dec. 12, 1968, Ser. No. 783,252
Int. Cl. G11c *19/00, 21/00*
U.S. Cl. 340—173RC **4 Claims**



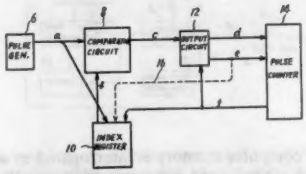
The disclosure embodies a dynamic, first-in-first-out buffer memory and includes means for selectively and sequentially recirculating and advancing the relative positions of the binary encoded data therein.

3,579,204
VARIABLE CONDUCTION THRESHOLD TRANSISTOR MEMORY CIRCUIT INSENSITIVE TO THRESHOLD DEVIATIONS
Andrew James Lincoln, Concord, Mass., assignor to Sperry Rand Corporation
Filed Mar. 24, 1969, Ser. No. 809,899
Int. Cl. G11c *11/40*
U.S. Cl. 340—173 **5 Claims**



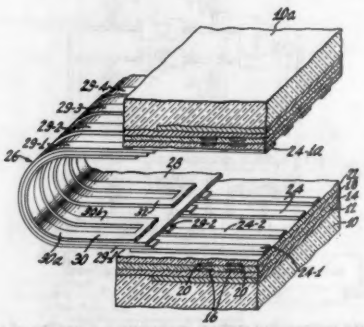
A memory circuit for application in a computer memory for storing a binary valued digit. The circuit comprises two insulated gate field effect transistors characterized by electrically controllable conduction thresholds established by potentials applied between the respective gate electrodes and substrates. A binary digit is stored by establishing a difference in threshold between the two transistors and is read by sensing the difference in current flow therebetween in response to an interrogation potential applied to the gate electrodes thereof. The binary value ONE or ZERO is stored by establishing a higher threshold for one transistor with respect to the other or for the other transistor with respect to the one.

3,579,205
PULSE COUNTING DEVICE WITH MEMORY
Takashi Aga, Akashi-shi, and Masami Yamanaka, Miki-shi, Japan, assignors to Yamato Scale Company, Limited, Akashi-shi, Japan
Filed Sept. 5, 1969, Ser. No. 855,565
Claims priority, application Japan, Nov. 21, 1968, 43/85,415
Int. Cl. G11c *13/04*
U.S. Cl. 340—173R **5 Claims**



Pulse counting circuit for measuring devices such as scales and the like wherein pulses are produced by motion of the measuring device and fed to a memory element. The memory element produces a second set of pulses which are compared in phase with the original pulses. The phase difference information and pulse count information are used to produce addition and subtraction instruction signals which signals are in turn used to produce a count confirming signal which is fed to the memory element to effect coordination of the original count stored therein with the count confirming signal.

3,579,206
LOW INDUCTANCE INTERCONNECTION OF CRYOELECTRIC MEMORY SYSTEM
Robert A. Grange, Belle Mead, N.J., assignor to RCA Corporation
Filed Dec. 16, 1968, Ser. No. 784,019
Int. Cl. G11c *5/06;* **H05k** *7/06*
U.S. Cl. 340—173.1 **9 Claims**



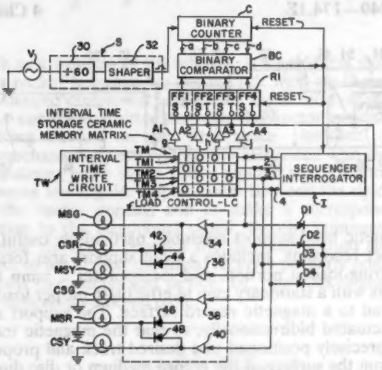
A length of flexible insulating material such as Mylar or Kapton having parallel conductors on one surface and including a magnetic field shield insulated from the conductors. The parallel conductors are connected at one end to lines at one edge of one cryoelectric memory plane and at the other end either to lines at the corresponding edge of the next adjacent plane, or to a terminal bar whose lines and shield are similar to that of the memory plane. The adjacent plane, in this case, is also connected to the terminal bar but via a second connector such as described. The shield comprises side-by-side diescrete conductive sections insulated

from one another, each section registering with, that is, lying under (or over) a pair of conductors. Each adjacent pair of conductors is driven in such manner that one carries current in one direction and the other "simultaneously" carries an equal amount of current in the opposite direction.

3,579,207
LOAD SEQUENCER CONTROLLER

Peter G. Bartlett, Bettendorf, Iowa, and Joseph E. Meschi, Lyons, Ill., assignors to Gulf & Western Industries, New York, N.Y.

Filed Nov. 14, 1967, Ser. No. 682,814
Int. Cl. G11c *11/22*
U.S. Cl. 340—173.2 **31 Claims**

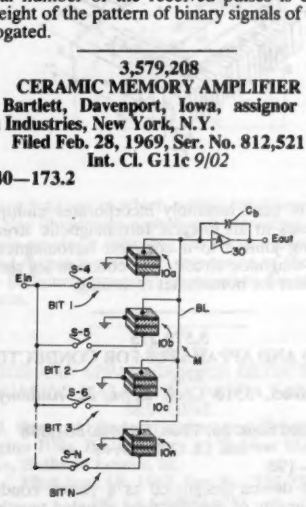


A load sequencer controller is disclosed herein which serves to sequentially allocate and time a plurality of load intervals. The controller includes a plurality of interval time storage memories, each corresponding with an associated load interval to be timed. Each of the memories includes a plurality of electrically alterable and interrogatable bistable memory means which serve to store binary information. The weighted binary content of each memory is a decimal number representative of a desired time duration for an associated load interval. An interrogation circuit serves to sequentially apply interrogation signals to the memories so that when any one memory is interrogated the output of that memory provides a pattern of binary signals. An actuating circuit receives pulses from a source of equi-time-spaced pulses and serves to actuate the interrogation circuit each time the decimal number of the received pulses is equal to the decimal weight of the pattern of binary signals of the memory last interrogated.

3,579,208
CERAMIC MEMORY AMPLIFIER

Peter G. Bartlett, Davenport, Iowa, assignor to Gulf & Western Industries, New York, N.Y.

Filed Feb. 28, 1969, Ser. No. 812,521
Int. Cl. G11c *9/02*
U.S. Cl. 340—173.2 **9 Claims**

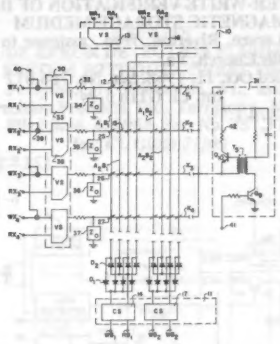


There is disclosed herein a ceramic memory system including a ceramic memory matrix comprised of a plurality of ceramic memory devices each having a first and a second surface respectively connected to a plurality of electrically conductive bit lines and a common line. The bit lines of the ceramic memory device are connected in common to an amplifier having parameters such that when one of the ceramic memory devices is interrogated, the output signal developed by the amplifier is not degraded by the impedance of the remaining ceramic memory devices.

3,579,209
HIGH SPEED CORE MEMORY SYSTEM

Thomas J. Gilligan, Palos Verdes Pennisula, and Arthur T. Nozaki, Torrance, Calif., assignors to Electronic Memories, Incorporated, Hawthorne, Calif.

Filed Sept. 6, 1968, Ser. No. 758,076
Int. Cl. G11c *5/02, 11/06*
U.S. Cl. 340—174 **17 Claims**



A magnetic core memory system is disclosed comprising a rectangular array of magnetic cores. A first plurality of independent wires thread cores along one axis and a second plurality of dependent wires thread cores along the other axis for coincident-current selection of cores to be switched. The second plurality of wires are current dependent in that the current through a selected wire is returned in the opposite direction through unselected wires in parallel. In that manner, a selected core may be overdriven with more than half-select current I_h in one of the first plurality of wires and half-select current I_h in one of the second plurality of wires. The unselected cores threaded by the overdriven wire receive a net current of I_h due to return current through unselected ones of the second plurality of wires.

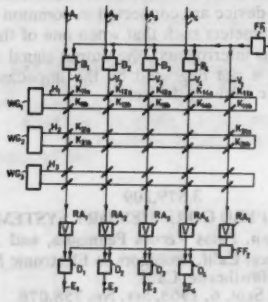
3,579,210
MATRIX STORAGE DEVICE

Heinrich Eduard Van Bruck, and Theodoor Holtwijk, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 24, 1969, Ser. No. 809,704
Claims priority, application Netherlands, Apr. 10, 1968, 6,805,155
Int. Cl. G11c *7/04, 5/02, 11/06*
U.S. Cl. 340—174 **4 Claims**

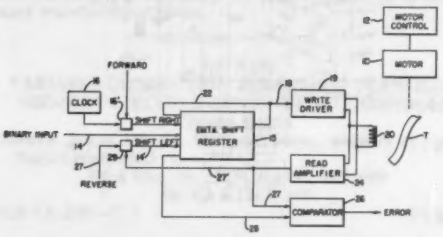
In order to reduce stray of the output voltage in reading information from a magnetic matrix store, the information is written as many times in the inverted state as in the noninverted state, on average, so that the heat dissipation on an

average is the same for all cores. The inverted or noninverted state of the written information is recorded by an auxiliary



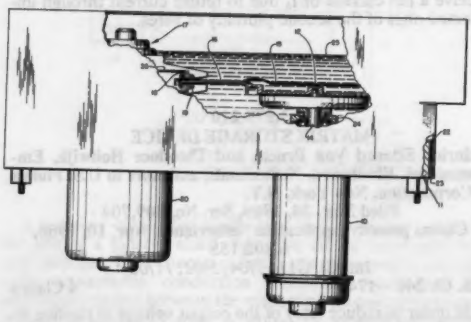
core joined to each word, which core is read when the information of the word concerned is read.

3,579,211
READ-AFTER-WRITE VERIFICATION OF DATA ON MAGNETIC STORAGE MEDIUM
Raymond B. Larsen, Riverton, Wyo., assignor to Datel Corporation, Falls Church, Va.
Filed Oct. 11, 1968, Ser. No. 766,677
Int. Cl. G11b *5/44*
U.S. Cl. 340—174.1 **14 Claims**



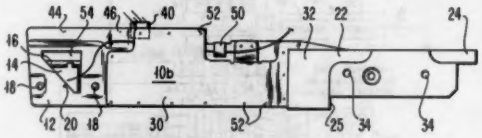
Verification of data recorded on a magnetic storage medium is accomplished by reversibly driving the medium past a common record/reproduce head in order to successively record and play back each character of information and to verify the data recorded by comparing the information played back with the input data supplied for recording.

3,579,212
A REPRODUCING HEAD IN A LIQUID MEDIUM
Andrew Gabor, Bedford, Mass., assignor to Honeywell, Inc., Minneapolis, Minn.
Filed Mar. 5, 1968, Ser. No. 710,506
Int. Cl. G11b *5/60*
U.S. Cl. 340—174.1E **6 Claims**



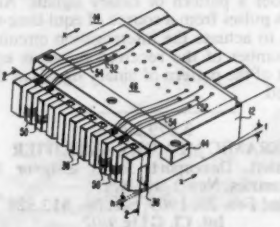
High density storage magnetic recording systems are described in which the reproducing transducers must be positioned in accurately maintained close proximity to the surface of the recording medium. Both transducers and recording medium are immersed in a liquid so that relative motion between the recording surface and the transducers develops a liquid film of controlled thickness for maintaining uniform close spacing.

3,579,213
MAGNETIC HEAD ACCESSING MECHANISM UTILIZING SPRING BIAS
Roy A. Applequist, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 17, 1968, Ser. No. 722,007
Int. Cl. G11b *5/60*
U.S. Cl. 340—174.1E **4 Claims**



A magnetic head support assembly, particularly useful for noncontact recording, includes a head support arm formed with a spring-loaded portion, and incorporates a ramp that cooperates with a stationary cam to effectuate proper loading of the head to a magnetic record surface. The support arm may be actuated bidirectionally, so that the magnetic transducer is precisely positioned at a desired track and properly spaced from the surface of the record medium or disc during record and playback, or retracted to a rest position.

3,579,214
MULTICHANNEL MAGNETIC HEAD WITH COMMON LEG
Erik R. Solyst, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed June 17, 1968, Ser. No. 737,759
Int. Cl. G11b *5/28*
U.S. Cl. 340—174.1F **1 Claim**

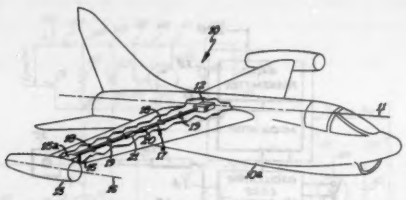


A read-write head assembly incorporates multiple transducing elements in an integral ferromagnetic structure, all elements being jointed to a common ferromagnetic leg to complete the magnetic circuit. The common leg serves as an air bearing slider for noncontact recording.

3,579,215
METHOD AND APPARATUS FOR CONDUCTING A SIGNAL
Denis R. Brasket, 3313 Croft Drive, St. Anthony Village, Minn.
Filed Sept. 26, 1966, Ser. No. 581,858
Int. Cl. G08c *19/48*
U.S. Cl. 340—198 **6 Claims**

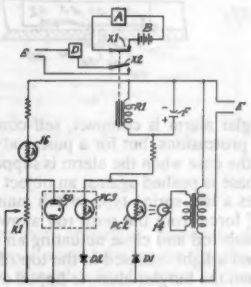
A cablelike device designated as a vector conduit comprised of a plurality of rigid sections coupled together at articulating joints permitting relative angular movement therebetween is utilized to transmit a directional signal from a signal generator on a first space platform, such as an air-

craft fuselage, to a signal receiver located on a second space platform which is not rigidly connected to the first platform,



such as a wing tip of the aircraft. A mechanical device, such as a rocket launcher, on the aircraft wing tip is oriented on the desired directional path by the signal receiver in response to a signal transmitted through the vector conduit from a sighting device on the first space platform. An electromechanical device operatively associated with each of the articulating joints in the vector conduit is utilized to measure or sense the angular displacement between the rigid sections of the vector conduit and to make a corresponding correction in the directional signal, thereby compensating for angular deviation between the first and second space platforms to insure that the signal receiver properly positions and orients the mechanical device, i.e., the rocket launcher, in the desired directional path.

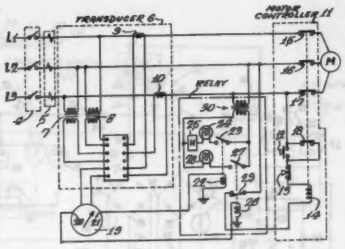
3,579,216
PARTICLE DETECTOR
Alfred W. Vasel, 222 Linwood St., Abington, Mass. 02351
Continuation of application Ser. No. 533,140, Mar. 10, 1966, now abandoned. This application July 8, 1969, Ser. No. 845,646
Int. Cl. G08b *17/10, 19/00*
U.S. Cl. 340—237 **2 Claims**



A smoke detector in which a light for illuminating smoke particles also illuminates a photocell providing a circuit path to maintain an alarm actuating device in a deenergized condition, and means is provided responsive to the detection of smoke to illuminate a second photocell to cause energization of the alarm.

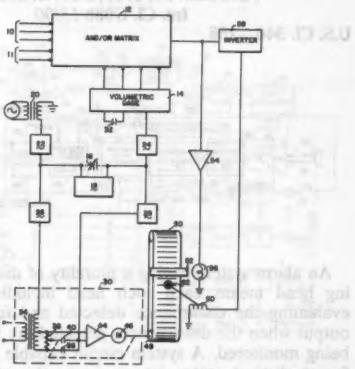
3,579,217
METHOD AND APPARATUS FOR DETECTING AND INDICATING MALFUNCTION OF A TABLETING MACHINE
Thomas J. Casey, Arlington Heights, and George F. Loeffler, Barrington Hills, Ill., assignors to Thomas Machinery Corporation, Hoffman Estates, Ill.
Filed June 10, 1968, Ser. No. 735,737
Int. Cl. G08b *21/00*
U.S. Cl. 340—253 **5 Claims**

Method and means for monitoring a multistation tableting machine with respect to the forces applied by tablet-forming punch means to tablets successively formed in and ejected from said machine which comprises continuously measuring



the electric power requirement of said machine with respect to predetermined overload and underload norms of operation.

3,579,218
ATTITUDE ERROR DETECTION FLUID GAUGING SYSTEM WITHOUT CORRECTION
Arthur M. Forsythe, Jr., Shelburne, Vt., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.
Filed Sept. 4, 1968, Ser. No. 757,375
Int. Cl. G08b *21/00*
U.S. Cl. 340—253 **5 Claims**

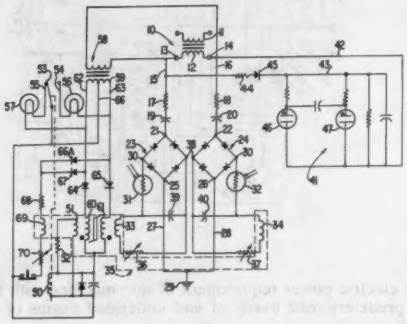


An aircraft fuel gauging system which is coupled to a standard mass fuel gauge and accepts signals from the aircraft pitch and roll sensors to produce an output signal which indicates whether or not the mass fuel gauge can be accurately read. The output signal may be used to actuate a warning signal flag or a red light at the fuel indicators to signal the pilot that the indicator is unreliable and that the aircraft attitude must be changed to obtain an accurate fuel reading.

3,579,219
LEAKAGE-CURRENT DETECTOR
Bodo M. Wolfframm, Claredon Hills, Ill., assignor to Sola Basic Industries, Inc., Milwaukee, Wis.
Filed Nov. 19, 1968, Ser. No. 776,893
Int. Cl. G08b *21/00*
U.S. Cl. 340—255 **11 Claims**

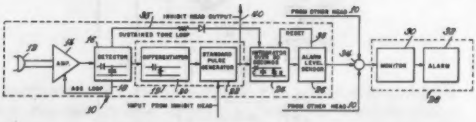
A leakage current or fault detector for isolated power lines in which independent detection circuits each including identical R-C networks operate sequentially from each line to ground. Any fault is fed into a magnetic summing amplifier

which is of the fail-safe type and drives an indicating relay. The fault may be either capacitive or resistive, or both, and is



detected on either or both lines, including a symmetrical fault. The detection circuits may be sequentially sampled by electronically operated photosensitive devices.

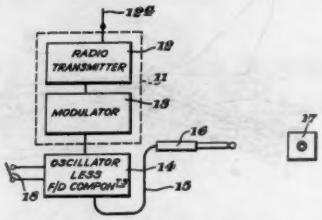
3,579,220
ALARM SYSTEM
Louis A. Stevenson, Jr., Houston, Tex., assignor to "Automatic" Sprinkler Corporation of America
Filed Mar. 28, 1969, Ser. No. 811,515
Int. Cl. G08b *13/00*
U.S. Cl. 340—258 **16 Claims**



An alarm system having a plurality of disturbance-detecting head means each such head including circuitry for evaluating the disturbance detected and for generating an output when the disturbances detected are alien to the area being monitored. A system circuit capable of assuming different distinct states interconnects the plurality of head means with an alarm. The system circuit changes from one of its states to another of its states in response to the generation of an output from any of the detection heads to thereby trigger the alarm. The alarm may also be triggered as a result of any tampering with the heads or the circuit or as a result of loss of power in the system.

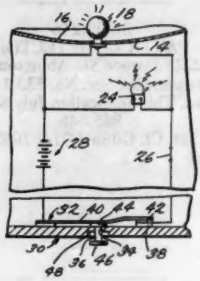
3,579,221
ALARM SYSTEM
John Raymond Ashley, "Kyama" Frome Road, Radstock, Bath, Somerset, and Colin Grahame Douglas, "Stoneybroke" Watergates, Colerne, Wiltshire, England
Filed May 31, 1968, Ser. No. 733,692
Claims priority, application Great Britain, May 31, 1967, 25200/67
Int. Cl. G08b *29/00*
U.S. Cl. 340—277 **1 Claim**

An alarm system for use in conjunction with a radio actuated location system in which a security guard or watchman carries a radio transmitter which transmits signals according to the location of the guard, the alarm system including circuitry to generate an alarm frequency, the guard having a switch (which may operate automatically if he is incapacitated) which, when actuated, causes the alarm



frequency to be transmitted (or cut off if it is normally being transmitted).

3,579,222
PORTABLE BURGLAR ALARM
Wilbern Marvin Freeman, 907 N.E. 111th St., Miami, Fla.
Filed Jan. 25, 1968, Ser. No. 700,534
Int. Cl. G08b *13/08, 13/00*
U.S. Cl. 340—283 **6 Claims**



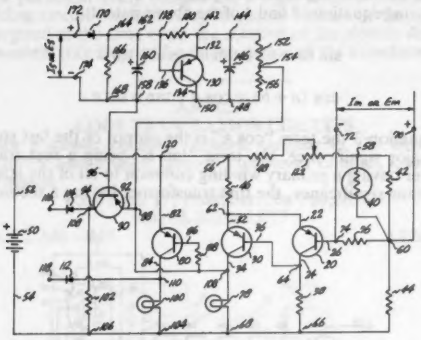
The burglar alarm is compact, self-contained and has no significant protrusions, but for a push rod which is pushed in flush with the case when the alarm is supported on its base or when the base is pushed against an object of value. The push rod engages a leaf spring-type switch maintaining it "open;" removal of force from the push rod allows the switch to extend the push rod and close actuating an alarm, for instance a buzzer and a light recessed in the top of the case. This will happen when the burglar alarm is tipped over or the object of value is moved from engagement with the push rod.

The foregoing abstract is not intended to be a comprehensive discussion of all of the principles, possible modes or applications of the invention disclosed in this document and should not be used to interpret the scope of the claims which appear at the end of this specification.

3,579,223
TRANSISTORIZED MONITORING CIRCUIT
Arthur B. McKaig, Bellevue, Wash. (P.O. Box 228, Belfair, Wash. 98528)
Filed June 25, 1968, Ser. No. 739,835
Int. Cl. G08b *21/00*
U.S. Cl. 340—248 **4 Claims**

The invention consists of modifications and improvements to the monitoring circuit of U.S. Pat. No. 3,293,630. These changes increase the sensitivity and accuracy of the monitoring circuit by an improved interconnection with the monitored circuit, provide an adjustment to compensate for manufacturing tolerances in components, provide an adjustment for matching the monitoring circuit to the monitored

circuit, eliminate problems with alternating current waveshape in the monitored circuit, eliminate false indications by effective use of time delay circuits and furnish more usable monitoring information by including a gating circuit.



3,579,224

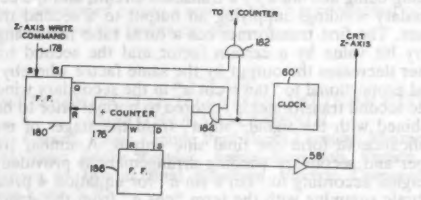
CHARACTER GENERATOR APPARATUS

John R. Griffin, Portland, and Charles A. Forsberg, Tigard, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Dec. 9, 1968, Ser. No. 782,396

Int. Cl. H01j *29/70*

U.S. Cl. 340—324 **11 Claims**



A character generator apparatus provides deflection signals to a cathode-ray storage tube for causing the electron beam thereof to move through a fixed pattern of dots called a dot matrix. The prospective movement of the electron beam through the dot matrix is very rapid. Input translating means detect when a particular location in the dot matrix is reached at which an elemental portion of the character is to be written by the electron beam. At this time, the electron beam is slowed down and enabled so this elemental portion is displayed and stored by the cathode-ray tube.

3,579,225

LIGHT PROBE CIRCUIT FOR PERSISTENT SCREEN DISPLAY SYSTEM

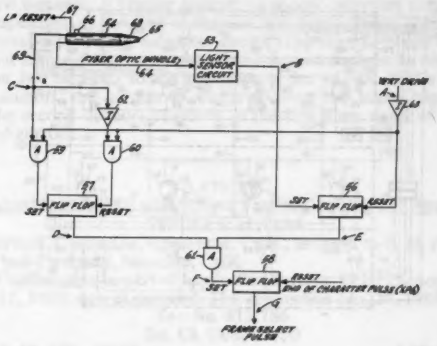
Robert John Clark, Dorion, Quebec, Canada, assignor to RCA Corporation

Filed Oct. 15, 1969, Ser. No. 866,552

Int. Cl. G06f *3/14*

U.S. Cl. 340—324A **8 Claims**

The light sensed by a light "probe" or "pen" during each field displayed on a persistent screen causes a signal to be stored for a duration which is a fraction of the field time. The placing of the probe in a light sensing position causes a second signal of a duration at least equal to one field time to be stored and which starts at a time after the pen is placed in its light sensing position at which the next field starts. A circuit responsive to the concurrent presence of both stored signals produces an output pulse which may be employed to signal the computer associated with the light probe.



3,579,226

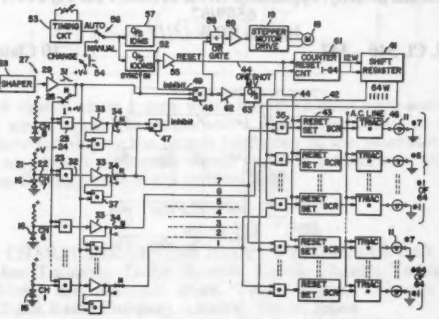
MULTIPOINT CONTROL SYSTEM

Robert J. Strehlow, Sunnyvale, Calif., assignor to Wehr Corporation, Milwaukee, Wis.

Filed Nov. 13, 1967, Ser. No. 682,123

Int. Cl. G08b *5/36*

U.S. Cl. 340—339 **10 Claims**



A multipoint control system provides visual display of a message with a matrix of light sources arranged in columns and rows. An input tape is coded with the display information by blacking out certain squares of the tape format which is similar to the display format or punching holes in the tape. The tape is then passed over a column of photosensitive devices and the information transferred to silicon controlled rectifiers which drive triacs coupled to the light sources. A shift register provides for sequential activation of the respective display columns of the light sources. The coded format tape is indexed and synchronized with the activation of the light sources of the various columns.

3,579,227

DIGITAL-TO-ANALOG CONVERTER SYSTEM

James W. Appelgren, Highland Park, Ill., assignor to The Louis Allis Company, Milwaukee, Wis.

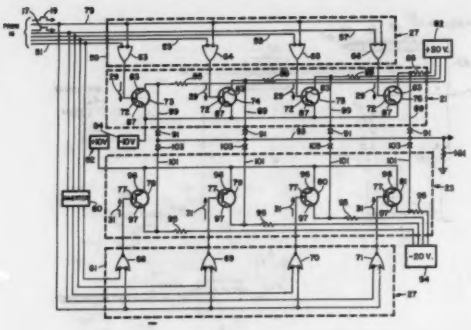
Filed May 17, 1968, Ser. No. 730,170

Int. Cl. H03k *13/04*

U.S. Cl. 340—347 **7 Claims**

The D/A converter system includes a positive D/A converter and a negative D/A converter having common outputs connected to ground. Logic circuitry provided for each D/A

converter is responsive to a polarity control signal for disabling one D/A converter from producing an analog output



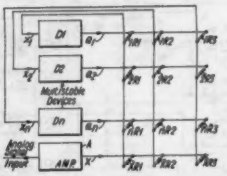
signal of one polarity while enabling the other D/A converter to produce an analog output signal of the other polarity in response to a digital input signal from a digital controller. Power supplies bias the positive and negative D/A converters to isolate the analog output signal generated by the enabled D/A converter from the disabled D/A converter.

3,579,228

ANALOG-TO-DIGITAL CONVERTER

Kenneth William Cattermole, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 26, 1968, Ser. No. 700,874
Claims priority, application Great Britain, Feb. 10, 1967, 6509/67
Int. Cl. H03k *13/17*
U.S. Cl. 340—347 **10 Claims**



An equilibrium type coder comprising an array of multistable and weighted stages interconnected with each other and the analog input to provide an input signal to each stage including the analog signal and weighted functions of the output signal of each stage. The weights of each stage as provided by weighted interconnects, or different biasing of the stages are such that the array has a plurality of stable states each corresponding to a different amplitude of the analog signal. The digital representation of the analog signal is provided by the state of the stages when the array is in a stable state.

3,579,229

PRECISION SWITCHING NETWORK FOR A DIGITAL TO ANALOG CONVERTER

Robert W. Tripp, Tuckahoe, N.Y., assignor to Inductosyn Corporation, Carson City, Nev.

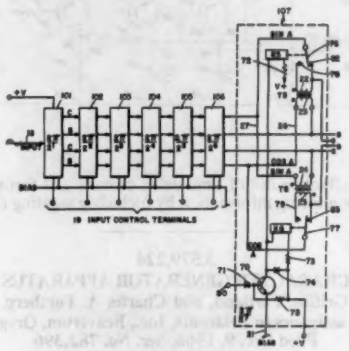
Filed Oct. 30, 1968, Ser. No. 771,748
Int. Cl. H03k *13/04*
U.S. Cl. 340—347DA **9 Claims**

A system for converting a digital number such as an angle into analog signals representing the sine and cosine of the angle including a plurality of network stages representing binary bits of 360°. A control activates certain stages whereby the sum of the corresponding bits represents the selected angle. The stages of major significance include inputs and transformers for generating output signals to serve as inputs to the stages of minor significance, such output signals being computed by stages in tandem operating in accordance with equations 1 and 2, column 3 of U.S. Pat. No. 2,849,668. The stages of minor significance operate in accordance with the following equations 3 and 4 of the above patent:

$$\sin(a+b) = \tan b \cos a + \sin a \quad (3)$$

$$\cos(a+b) = \cos a - \tan b \sin a \quad (4)$$

In equation 3 the term "cos a" is the output of the last stage of major significance, the term "tan *b*" being a first transformer having a primary winding common to all of the stages of minor significance, the first transformer having a secondary winding individual to each stage of minor significance, the secondary windings connected in series, each secondary winding being activated by a transistor circuit, and the active secondary windings supplying an output to a second transformer. The first transformer has a turns ratio increasing its binary bit value by a certain factor and the second transformer decreases the output by the same factor whereby the signal proportional to "tan *b* cos *a*" in the secondary winding of the second transformer is restored to normal prior to being combined with the signal "sin *a*" from the stages of major significance to form the final sine output. A similar transformer and secondary winding arrangement is provided for the signal according to "tan *b* sin *a*" for equation 4 prior to algebraic summing with the term "cos *a*" from the stages of major significance to form the final cosine output.

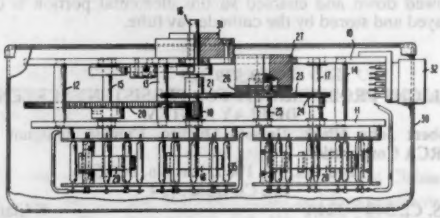


3,579,230

DIGITAL TRANSDUCER AND MEMORY SYSTEM THEREFOR

James H. Casterlin, Binghamton, N.Y., assignor to Quantametric Devices, Inc., Johnson City, N.Y.

Filed June 17, 1968, Ser. No. 737,714
Int. Cl. G08c *9/04*
U.S. Cl. 340—347 **6 Claims**



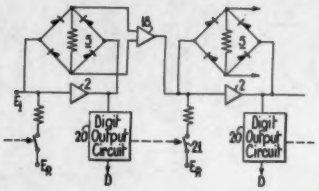
A transducer for indicating the extent of rotation of a shaft in digital units consists of several intergeared rotating circuit closure devices coupled to the shaft, each representing a

decade in the numerical system. The closure devices operate, by magnetic attraction, reed switches connected to relay circuits. Each closing and subsequent opening of a circuit connected to the closure devices prepares the eventual actuation of a particular relay designating a digit in each decade. A holding circuit for each relay maintains closure of the relays energized at the time when the rotation of the closure device is momentarily stopped for interrogation of the transducer.

3,579,231
CODE TRANSLATION CIRCUITS

Piotor Bylanski, London, England, assignor to The General Electric and English Electric Companies Limited, London, England

Filed Sept. 17, 1968, Ser. No. 760,269
Int. Cl. H03k *13/17*
U.S. Cl. 340—347 **4 Claims**

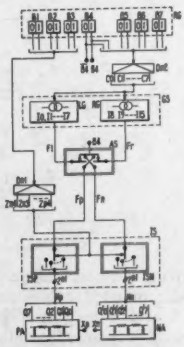


A P.C.M. coder using the Waldhauer principle (see U.S. Pat. No. 3,187,325), of incorporating a current-switching decision-device in an amplifier feedback loop, in which each coding stage has only a single high-gain amplifier. In each such stage, the input analogue signal to the stage and a reference voltage are supplied to the amplifier and four diode rectifiers are connected in a bridge circuit in a feedback path across the amplifier. The amplifier of each stage supplies a digital signal representing the coding effected by that stage and the analogue output signal for passing onto the next stage is developed across a resistor which is connected across one diagonal of the bridge circuit.

3,579,232
NON-LINEAR DIGITAL TO ANALOG DECODER WITH A SMOOTH CHARACTERISTIC

Pierre Girard, Paris; Claude Paul Henri Lerouge, Maurepas, and Marc Andre Regnier, Aulnay-Sous-Bois, France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 23, 1969, Ser. No. 818,554
Claims priority, application France, Apr. 30, 1968, 150085
Int. Cl. H03k *13/04*
U.S. Cl. 340—347 **6 Claims**

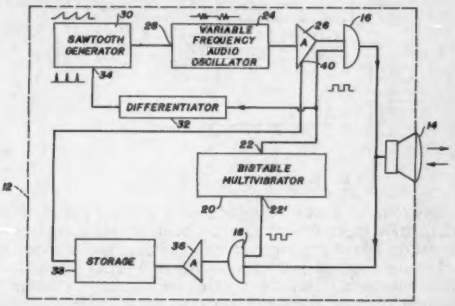


A digital to analog decoder or converter is disclosed. The decoder has a smooth nonlinear characteristic of the hyperbolic sine type. This smooth characteristic is contrasted to a nonlinear characteristic approximated by a plurality of straight line segments in the prior art. The decoder of this case includes a register to store a 7-digit code to be decoded. A first decoder circuit decodes the last four digits of the 7-digit code. Two groups of current generators (a first selection circuit) responding to the output of the first decoder produce two currents. A bipolar inverter (a second selection circuit) responding to the first of the last four digits directs the two currents to a third selection circuit. The third selection circuit responds to the output of of a second decoder to direct the two currents to the appropriate one of two ladder attenuators, the outputs of which produce the analog signal. The second decoder responds to the first three digits of the 7-digit code.

3,579,233
AMBIENT NOISE FREQUENCY RESPONSIVE AUDIBLE VEHICLE ALARM

Herbert A. Raschke, Greenbrae, Calif., assignor to E. D. Bullard Company, Sausalito, Calif.

Continuation-in-part of application Ser. No. 571,779, Aug. 11, 1966, now abandoned. This application Jan. 27, 1969, Ser. No. 813,786
Int. Cl. G08b *23/00*
U.S. Cl. 340—384E **6 Claims**

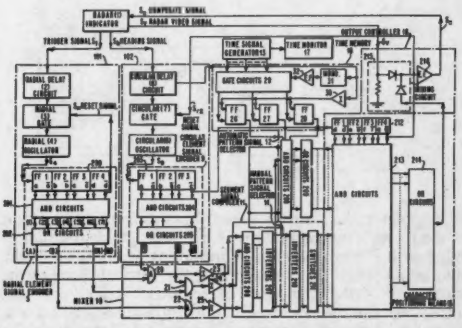


A vehicle alarm system which has an ambient noise sensor, an alarm signal generator, and a system responsive to the sensor for varying the output frequency of the generator so as to produce a warning signal that has a frequency other than the frequency of the ambient noise.

3,579,234
CHARACTER GENERATOR FOR RADAR DISPLAY

Takao Tsumura; Toshio Kaooka; Keisuke Suzuki; Yoshiaki Ueda, and Naoyoshi Oishi, Tokyo, Japan, assignors to Japan Radio Company, Limited, Tokyo, Japan

Filed May 14, 1969, Ser. No. 824,514
Claims priority, application Japan, May 15, 1968, 43/32655
Int. Cl. G01s *7/12, 7/22*
U.S. Cl. 343—5 **19 Claims**



A character-generating system for use with a radar system wherein coded radial element signals and coded circular ele-

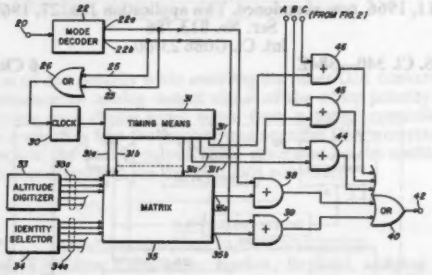
ment signals are generated in response to the trigger and heading signals, respectively, generated by the radar system. The coded radial and circular element signals are combined to form a plurality of pattern signals representing a plurality of characters. The pattern signals are then selected and combined with the video radar information to form a composite signal which is fed to the radar display.

3,579,235

COLLISION AVOIDANCE READOUT ON AIR TRAFFIC CONTROL RADAR BEACON SYSTEMS

Kenneth Luke Straub, Fort Lauderdale, and Wayne Gregory Shear, Pompano Beach, Fla., assignors to The Bendix Corporation

Filed June 18, 1969, Ser. No. 834,432
Int. Cl. G01s 9/56
U.S. Cl. 343—6.5 **5 Claims**



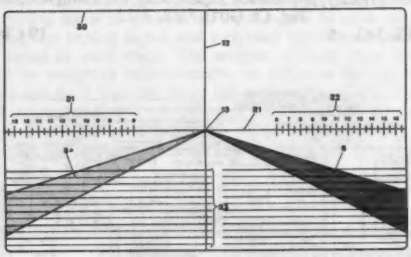
A system for transmitting collision avoidance maneuvering information together with conventional air traffic control information by the same aircraft transponder. The transponder includes gating apparatus for adding in a serial format both the maneuvering and the control information in order to transmit a single combined response to a single air traffic controller interrogation.

3,579,236

TEMPLATE FOR EVALUATING PHOTOGRAPHS OF DOPPLER RADAR SPEED MEASUREMENTS

Kurt Wilhelm Piechocki, Uster, Switzerland, assignor to Zellweger, Ltd., Uster, Switzerland

Filed Jan. 24, 1969, Ser. No. 793,685
Claims priority, application Switzerland, Feb. 28, 1968, 2915
Int. Cl. G01s 9/44
U.S. Cl. 343—8 **9 Claims**



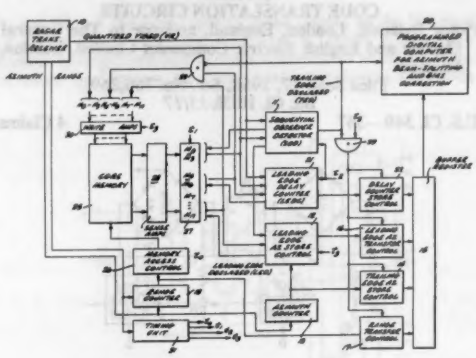
A doppler radar vehicle speed measurement template is provided with a representation of the photograph zone intersecting with a horizontal line representing the horizon of the road and a vertical line representing the vertical plane of the optical axis of the camera. The template is laid over the photograph with the vertical and horizontal lines aligned with the center of the photograph and with either the vanishing point of the road or a point at the height of the camera to accurately locate the vehicle in the photograph zone.

3,579,237

METHOD AND APPARATUS FOR AZIMUTH BIAS ERROR CORRECTION OF SEQUENTIAL-OBSERVER DETECTORS

Richard D. Steingart, Dubendorf, Switzerland, and Richard D. Wilmot, Brea, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed June 24, 1969, Ser. No. 836,010
Int. Cl. G01s 9/02
U.S. Cl. 343—10 **22 Claims**



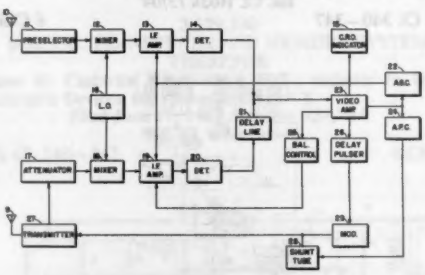
A system is disclosed for the correction of azimuth bias error in sequential-observer detectors for surveillance radar systems which assume an average value of azimuth bias in declaring the leading and trailing edges of a target. After normal beam-splitting, the apparent azimuth of the target is corrected by subtracting the effect of half the sweeps that occurred without a video return while searching for the leading edge. Each such sweep has the effect of delaying declaration of a leading edge by one or two sweeps, depending on the pattern of video returns received.

3,579,238

AUTOMATIC POWER CONTROL OF A PULSE MODULATOR

Andrew V. Haeff, Washington, D.C., and Franklin H. Harris, Accokeek, Md.

Filed Feb. 20, 1971, Ser. No. 649,104
Int. Cl. G01s 7/42; H04k 3/00
U.S. Cl. 343—18E **7 Claims**



In apparatus receiving periodic radiated pulses and transmitting other periodic radiated pulses responsively to said received pulses and in which the gain of the receiving means in said apparatus is subject to broad variation, means for controlling the output power of the transmitter in said system so that the transmitted pulses fed back through the receiving means do not exceed a selected amplitude, which comprises, a vacuum tube biased so as to be rendered conducting only by the received periodic pulses; a pulse generating means in-

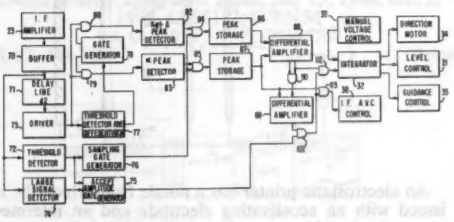
itiated into operation for one pulse only when said vacuum tube is rendered conducting; diode clipping means substantially removing the received periodic pulses from the output of the receiving means and leaving substantially only the portion of the transmitted signal which is fed back through the receiving means; means rectifying the output of the clipping means to form a bias voltage; a variable gain amplifier receiving the output from the pulse generating means, means applying said bias voltage to said variable gain amplifier so as to decrease the gain thereof when the average amplitude of the output of the clipping means increases; rectifier means connected so as to produce a negative direct current potential from an alternating current input; capacitor means coupling the output of the amplifier to the latter rectifier means; a power supply providing a positive and a negative source of potential; a normally conducting cathode loaded vacuum tube having a grid connected across the power supply, the cathode load of said vacuum tube comprising two serially connected resistors, the latter rectifier means being connected so as to operate with reference to the potential of the junction of the two cathode resistors and so that its output is applied to the grid of the cathode loaded vacuum tube; and a vacuum tube having a grid connected in shunt across the power input to the transmitter, the grid of the shunting vacuum tube being connected to the junction of the two cathode resistors.

3,579,239

ANGULARLY SELECTIVE MONOPULSE RECEPTION

William O. Purcell, Jr., Maitland, and Walter D. Trippe, Orlando, Fla., assignors to Martin-Marietta Corporation, Middle River (Baltimore County), Md.

Filed July 13, 1965, Ser. No. 471,523
Int. Cl. G01s *9/22*
U.S. Cl. 343—16SD **20 Claims**



This invention relates to an angularly selective monopulse system for receiving desired pulse signals, having means for determining whether an incident pulse was received from within a desired angular range. If not so received, the pulse is rejected, but if it was so received, it is further processed and the information it provides is utilized for appropriately adjusting the center of the acceptance sector. This information may also be used for the physical steering of the vehicle or missile upon which it may be mounted.

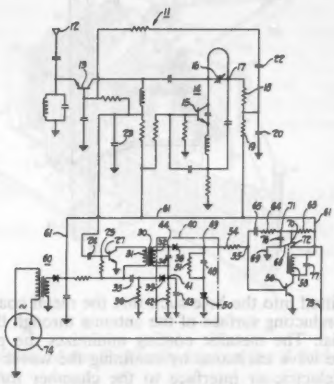
3,579,240

SELECTIVE RADIO RECEIVER SYSTEM

Andrew F. Deming, Alliance, Ohio, assignor to Alliance Manufacturing Company, Inc.

Filed Apr. 30, 1968, Ser. No. 725,294
Int. Cl. H04b *1/00, 1/06, 7/20*
U.S. Cl. 343—228 **21 Claims**

The disclosure shows a remotely controlled radio receiver circuit which may be used to control a garage door operator, for example, from a low-power remote transmitter. The signal emitted by the transmitter includes a carrier as modulated by a lower frequency, for example an audiofrequency, which signal is amplified in the receiver, detected and supplied to an audiofrequency resonant load and to a resistance load. These two loads are connected in opposition so that if the received signal is of the proper carrier frequency to be amplified and passed through the first stages of the receiver and if the audiofrequency is of the proper preselected



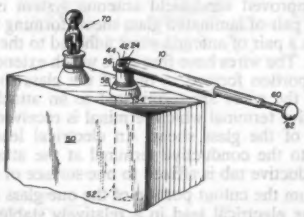
frequency to be resonated by the audiofrequency resonant circuit, a resonant voltage signal is passed. A first time delay capacitor is connected in a circuit to give only time delay of turn turn-on of a load relay, and a second time delay capacitor is connected in circuit to give only time delay of dropout of the relay, and in this manner telemetering or other relatively rapid pulsed signals, even of the proper carrier and audiofrequencies, do not actuate the relay. The foregoing abstract is merely a resume of one general application, is not a complete discussion of all principles of operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

3,579,241

TELESCOPING ROD ANTENNA WITH HINGED JOINT AT A MEDIAL SECTION

Santo M. Antista, Clifton; Milton M Koptula, Denville, and Gerard L. Burggraf, Essex Fells, N.J., assignors to said Antista and said Koptula assignors to Adronics, Inc., Verona, N.J.

Filed Nov. 18, 1968, Ser. No. 776,456
Int. Cl. H01q *1/24, 9/44*
U.S. Cl. 343—702 **5 Claims**



An antenna system including at least one set of telescoping tubes with two adjacent tubes of a set being hinged together to permit a portion of the tubes to assume a horizontal, as well as a vertical, position. The tubes, including the hinge assembly, are all retractable into the tube of largest diameter.

3,579,242

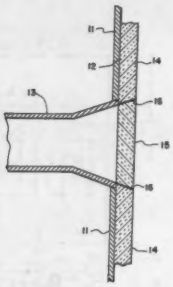
ANTENNA DESIGN FOR SURFACE WAVE SUPPRESSION

William L. Grantham, Yorktown, Va., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Dec. 23, 1969, Ser. No. 887,700
Int. Cl. H01q *1/28, 13/00*
U.S. Cl. 343—708 **6 Claims**

Means for suppressing the excitation of electromagnetic surface waves on a dielectric converter antenna. A hole is cut

in the dielectric where it covers the antenna. A plug of the dielectric material is coated around its rim with a metal and



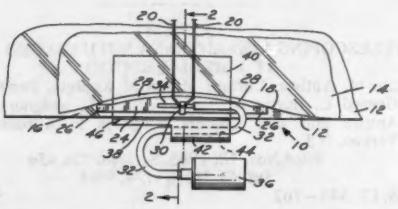
then fitted into the hole such that the metal coating extends the conducting surface of the antenna through the dielectric material. The metallic coating minimizes the possibility of surface wave excitation by confining the waves reflected by the dielectric-air interface to the chamber formed by the coating.

3,579,243

WINDSHIELD ANTENNA SYSTEM

Richard T. Dickason, Birmingham, and John A. Richardson, Harper Woods, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 11, 1969, Ser. No. 848,799
Int. Cl. H01q 1/32
U.S. Cl. 343—713 **8 Claims**



An improved windshield antenna system is described in which a pair of laminated glass sheets forming the windshield contains a pair of antenna wires adhered to the laminating interlayer. The wires have free ends which extend out beyond a cutout portion formed in one of the glass sheets. The free ends of the wires are terminated to an attaching area of a conductive terminal which terminal is received in the cutout portion of the glass sheet. An electrical lead is also connected to the conductive terminal at the attaching area. A nonconductive tab is affixed to one surface of the glass sheet away from the cutout portion of the one glass sheet. The tab holds the electrical lead in a relatively stable position with respect to the attaching area of the conductive terminal at which the lead is terminated to the antenna wires. A potting compound overlies the region of the termination of the antenna wires and the electrical lead to the attaching area of the conductive terminal.

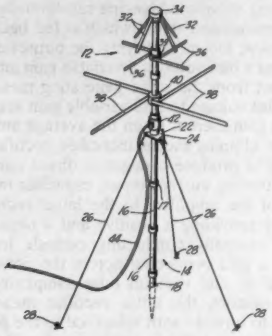
3,579,244

COLLAPSIBLE ANTENNA EMPLOYING FLEXIBLE TAPE RADIATORS

Richard C. Dempsey, Chatsworth, and Francis E. Lind, Granada Hills, Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 27, 1968, Ser. No. 755,563
Int. Cl. H01q 21/26, 15/20
U.S. Cl. 343—797 **5 Claims**

A plurality of radiating elements fabricated of flexible thin steel is secured to a telescoping mast. A ground plane is formed of a plurality of similar steel members which are mounted in a plane perpendicular to the mast. Within the



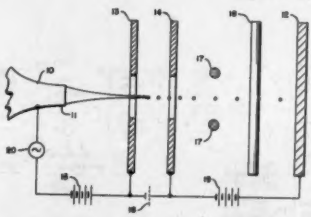
mast are cables and auxiliary electrical equipment. The radiating elements, the ground plane elements, and the mast are completely collapsible into a compact package.

3,579,245

METHOD OF TRANSFERRING LIQUID

James M. Berry, Princeton, N.J., assignor to Teletype Corporation, Skokie, Ill.

Filed Dec. 7, 1967, Ser. No. 688,947
Int. Cl. G01d 15/18
U.S. Cl. 346—1 **9 Claims**



An electrostatic printer has a nozzle from which the ink is issued with an accelerating electrode and an intermediate electrode placed between the nozzle and the platen or target. A high voltage potential difference is established between the nozzle and the target with an intermediate potential being applied to the accelerating and intermediate electrodes. A sufficient potential difference exists between the nozzle and the accelerating electrode to draw the ink from the nozzle into a fine stream, and a sinusoidally varying field is superimposed on the field between the nozzle and the accelerating electrode to establish a high frequency vibration in the electrostatically charged ink stream. Droplet formation then takes place in synchronism with the sinusoidally varying field in a region of a weak field between the accelerating and intermediate electrodes which are at the same or only slightly different potentials, with the size and spacing of the droplets being controlled by the frequency of the sinusoidally varying field. As a result, droplets of substantially uniform size, substantially uniformly spaced apart, are formed.

3,579,246

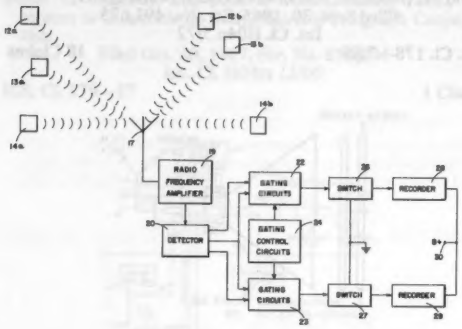
TIME SHARING RECORDER DRIVE CIRCUIT

Theodore Lauer Rhyne, Summit, N.J., and Karl F. McCready, San Pedro, Calif., assignors to Northrop Corporation, Beverly Hills, Calif.

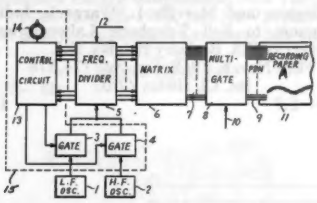
Filed Mar. 4, 1969, Ser. No. 804,079
Int. Cl. G01d 9/00
U.S. Cl. 346—34 **4 Claims**

Navigational signals having pulse widths in accordance with navigational lines of position are fed to logical gating

circuitry, including a pair of AND gates and an OR gate, the outputs of the AND gates being fed to an OR gate. The AND gates are alternately gated ON by means of a flip-flop, the OR gate output thus alternately including the signals fed to each of the AND gates. The output of the OR gate is utilized to control a switching circuit which controls the current to the magnetic drive coil of a chart recorder, the writing element of the recorder being successively deflected to positions indicative of the signals fed to each AND gate in accordance with the average current in the drive coil.



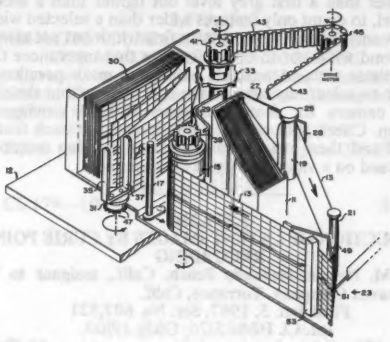
3,579,247
MULTISTYLUS PEN RECORDING SYSTEM
Kiyomi Minohara; Hiroshi Ishida, Nishinomiya; Tomoyoshi Miyata; Takeyoshi Takashima, Kobe, and Yoichi Umehara, Nishinomiya, Japan, assignors to Furuno Electric Company, Ltd., Minamitakaki-gu, Nagasakiken, Japan
Filed July 14, 1969, Ser. No. 841,437
Claims priority, application Japan, July 15, 1968, Dec. 5, 1968, 43/50142;43/89453
Int. Cl. G01d *5/247;* **G01s** *7/60*
U.S. Cl. 346—35 **7 Claims**



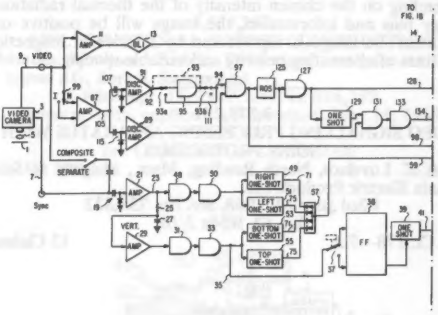
A multistylus pen recording system having a plurality of styli arranged transversely of and in contact with recording paper, means for generating a series of signal pulses which are applied in sequence to the styli for recording said pulses and means for producing a selectively variable high frequency signal to control the spacing of said pulses and thereby effect a variation in the magnification of the pattern recorded on the paper.

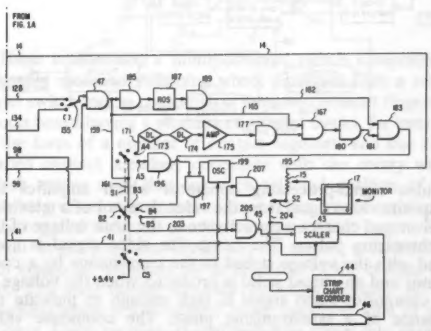
3,579,248
HORIZONTAL Z-FOLD RECORDER
Walter R. McGrath, Jr., Gloucester, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed June 11, 1969, Ser. No. 832,241
Int. Cl. G01d *15/30*
U.S. Cl. 346—76 **12 Claims**

A strip chart recording mechanism unfolds Z-folded paper from a supply stack and guides the paper past a recording station. The paper is then refolded and stacked in a Z manner. The mechanism operates to feed the paper horizontally with respect to a ground plane. The recording station includes two knife edges for engaging opposite surfaces of the paper. One knife edge serves as a recording platen in conjunction with a writing stylus, and the other knife edge counteracts the effect of the first knife edge on the Z-fold creases in the paper.



3,579,249
FEATURE COUNTER HAVING BETWEEN LIMITS AMPLITUDE AND/OR WIDTH DISCRIMINATION
Raymond D. Dewey, Bon Air; Robert S. Mapes, and Garth S. Jones, Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.
Continuation-in-part of application Ser. No. 767,614, Oct. 15, 1968. This application Aug. 8, 1969, Ser. No. 848,474
Int. Cl. G01n *15/02;* **H04n** *7/18*
U.S. Cl. 178—6 **16 Claims**

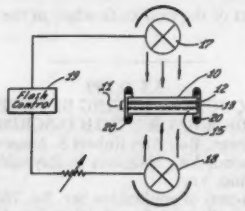




A specimen analyzer including a video camera for scanning a specimen and selectively counting features

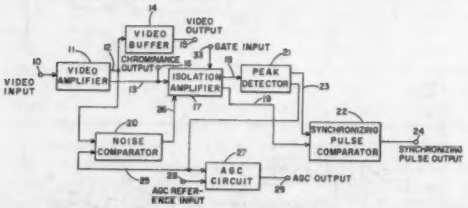
thereof on the basis of grey level and size. The device may operate in several modes to count only features darker (or lighter) than a selected grey level, to count only features that are darker than a first grey level but lighter than a second grey level, to count only features wider than a selected width, to count only features wider than a first width but not as wide as a second width, or to count features that meet more than one of these tests. A variable electronic mask permits the operator to select any area of the specimen within the view of the camera for feature analysis without moving the specimen. Check spot pulses are generated for each feature counted and these may be displayed on a video motor superimposed on a video display of the specimen.

3,579,250
PRODUCTION OF LATENT IMAGES BY CURIE POINT RECORDING
Alfred M. Nelson, Redondo Beach, Calif., assignor to The Magnavox Company, Torrance, Calif.
Filed Jan. 5, 1967, Ser. No. 607,521
Int. Cl. H04n *5/76;* **G03g** *19/00*
U.S. Cl. 178—6.6 **16 Claims**



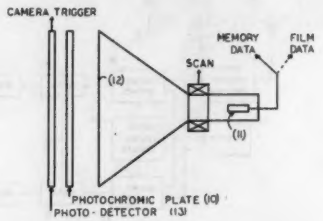
A latent magnetic image, positive or negative, is provided on a low Curie point storage carrier by providing concurrently radiation for a line raster and for pictorial information. Depending on the chosen intensity of the thermal radiation energy bias and information, the image will be positive or negative. The image is represented by a series of magnetic pole lines of alternating polarity and variable spacing.

3,579,251
VIDEO SIGNALLING PROCESSING APPARATUS WITH NOISE PROTECTION
Ralph E. Lovelace, North Reading, Mass., assignor to Sylvania Electric Products Inc.
Filed June 24, 1968, Ser. No. 739,323
Int. Cl. H04n *3/16*
U.S. Cl. 178—7.3 **13 Claims**



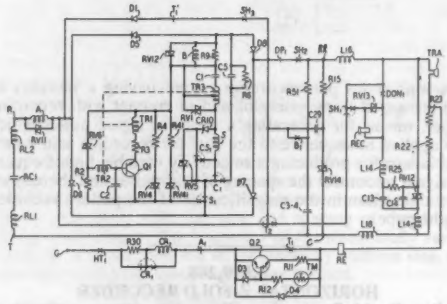
Video signal-processing apparatus which amplifies the composite video signal from the video detector of a television receiver and charges a capacitance to the peak voltage of the synchronizing pulses. The composite video signal is compared with the voltage stored in the capacitance by a comparator and an output pulse is produced when the voltage of the composite video signal is high enough to indicate the presence of a synchronizing pulse. The composite video signal is also compared with the stored voltage by a second comparator, and a noise-cancelling signal which prevents noise from affecting the voltage stored on the capacitance or the first comparator is generated when the voltage of the composite video signal is high enough to indicate the presence of noise.

3,579,252
COMPUTER DRIVEN DISPLAYS EMPLOYING PATTERN RECOGNITION TECHNIQUES
David M. Goodman, 3843 Debra Court, Seaford, N.Y.
Filed Sept. 30, 1965, Ser. No. 491,673
Int. Cl. H04n *5/72*
U.S. Cl. 178—7.85 **18 Claims**



Different displays are generated on the face of a color cathode ray tube to provide easy-to-interpret patterns representative of input data. The display may be analyzed by human observers, or by automatic means. The patterns are matrixlike in format. Analogue input data is quantized so that the position and/or color of points in the matrix represent a comparison of the input data to reference data. For testing purposes, the data is quantized into five levels and a different color is assigned to each level. Digital input data is transformed into color bits for visually testing the memory bank of a computer. Test data which varies in time is superimposed on data of fixed format to provide a "Blink" effect when the two sets of data do not match. Parity detectors are used to trigger a camera unit which takes photographs of the display screen when mismatch or out-of-tolerance conditions are detected. One such detector consists of an in-line of assembly of display screen, photochromic screen, and plastic scintillator.

3,579,253
COIN TELEPHONE CIRCUIT FOR DIAL-TONE-FIRST SERVICE
John E. Edington, and Merville L. Warnock, Indianapolis, Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.
Filed Nov. 8, 1968, Ser. No. 774,376
Int. Cl. H04m *17/02*
U.S. Cl. 179—6.3 **11 Claims**

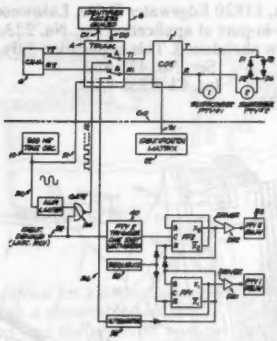


A conventional coin telephone circuit is modified for dial-tone-first service (limited service without a coin deposit) by various interrelated circuit changes which also provide additional features including a shift from an initial rate mode to a subsequent deposit mode in response to battery reversal and a means for indicating that an adjustable initial rate deposit or an overtime deposit has been made.

3,579,254
CALLING SUBSCRIBER PARTY LINE IDENTIFICATION CIRCUIT

Doyle V. Carmody, and John S. Welch, Milan, Tenn., assignors to International Telephone and Telegraph Corporation

Filed Oct. 30, 1967, Ser. No. 678,804
Int. Cl. H04m *13/00*
U.S. Cl. 179—17 1 Claim

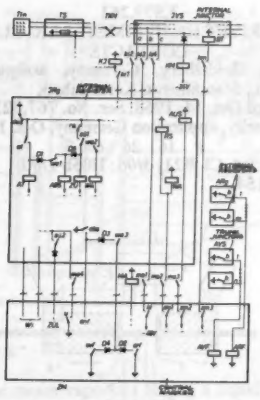


One party on a two-party line is connected in series with a diode circuit across the tip and ring lines. The diodes have a breakdown voltage above the level of AC tone from a central office and the tone does not pass through. The other party is connected directly across the tip and ring lines and AC tone transmitted to it when the hookswitch is "off" is transmitted through to a control circuit. The control circuit senses the presence or lack of tone and provides appropriate control signals which can be used to supply or control an indication of which is the calling party to the toll center.

3,579,255
OUTGOING TRUNK CONNECTION FOR PABX

Walter Kaiser, Mohrenacker, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed June 18, 1968, Ser. No. 737,925
Claims priority, application Germany, July 14, 1967, ST27136
Int. Cl. H04q *3/42*
U.S. Cl. 179—18 1 Claim

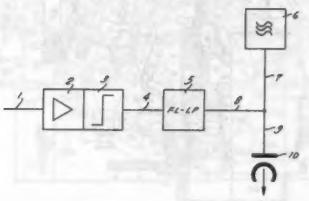


A central marker, connected to a PABX, supervises the busy condition of trunk junctors and external registers. If, in an internal register, a call for a trunk line has been detected and all the external registers are busy, but at least one trunk junctor is available, the marker restores the time control of the internal register. As soon thereafter as an external register becomes available, the marker is requested again and the trunk connection is initiated.

3,579,256
COMBINATION SUBCARRIER FILTER AND BIAS TRAP FOR MAGNETIC TAPE RECORDERS

Gerd Cyrener, and Joachim Fahrendholz, Frankfurt-Main-Seckbach, Germany, assignors to Braun Aktiengesellschaft, Frankfurt, Main, Germany

Filed July 1, 1968, Ser. No. 741,797
Claims priority, application Germany, June 30, 1967, B93256
Int. Cl. G11b *5/00*
U.S. Cl. 179—100.2 4 Claims

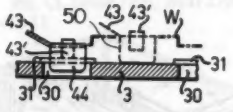


A recording amplifier receives audio frequency signals having additional undesired high frequency noise and furnishes corresponding amplified signals at a recording output. These are filtered by a low pass filter which passes the audio signals but rejects the high frequency noise. The output of the filter is directly connected to a premagnetization oscillator output and the recording head. Thus it also serves to decouple the premagnetization oscillator output from the recording amplifier, while permitting the full premagnetization oscillator output to be transmitted to the recording head.

3,579,257
MULTIPOSITIONAL SWITCH CONSTRUCTION

Helmuth Spreitzer, Zurich, Switzerland, assignor to Contraves AG, Zurich, Switzerland

Filed Apr. 15, 1969, Ser. No. 816,257
Claims priority, application Switzerland, May 13, 1968, 7085/68
Int. Cl. H01h *19/58, 21/78, 3/00*
U.S. Cl. 200—11 7 Claims



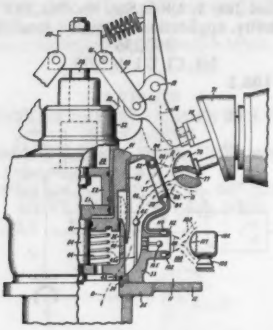
There is disclosed a multipositional switch comprising a rotatably mounted switching wheel equipped with a rotary wiper switch means possessing at least two contact fingers. A circuit board having a plurality of contact tracks, for instance in the form of a number of contact segments and one ring-shaped contact member, cooperate with the rotary wiper switch means such that for each selected position of the switching wheel at least two of the contact tracks are electrically coupled with one another via the contact fingers. The circuit board possesses a plurality of spaced recesses, and cam means are provided for at least one of the contact fingers. The cam means for each switching position of the switching wheel being located in an associated one of said recesses. Upon rotation of said switching wheel into its next switching position, the cam means move out of the associated one recess and along the surface of the circuit board, to thereby rapidly raise the contact finger provided with such cam means from its associated contact track located at the circuit board.

3,579,258

GAS BLAST CIRCUIT BREAKER USING A GENERALLY AXIAL FLOW MAIN BLAST

John W. Beatty, Newtown Square, Pa., assignor to General Electric Company

Filed Sept. 23, 1968, Ser. No. 761,674
Int. Cl. H01h *33/70*
U.S. Cl. 200—148 5 Claims



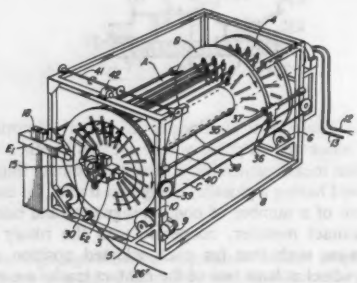
Discloses a gas-blast circuit breaker comprising an upstream electrode, a downstream electrode spaced therefrom, and an orifice having an opening positioned between said electrodes. During interruption, an arc established between the electrodes extends through the orifice opening, and a gas blast is caused to flow through the orifice opening via paths extending along the external surface of the upstream electrode and generally axially of the arc adjacent the upstream electrode. Improved flow conditions adjacent the upstream electrode are produced by providing a series of jets issuing from circumferentially-spaced points about the orifice opening and directed convergently toward the central region of the downstream face of the upstream electrode.

3,579,259

APPARATUS FOR MAKING A DOUBLE-LAYER REINFORCING CAGE FOR CONCRETE PIPES

Shigeru Kato, Koza-gun, Japan, assignor to Nippon Rocla Pipes Co., Ltd., Tokyo, Japan

Filed June 23, 1969, Ser. No. 835,681
Int. Cl. B23k *11/00;* B21f *15/08*
U.S. Cl. 219—56 4 Claims



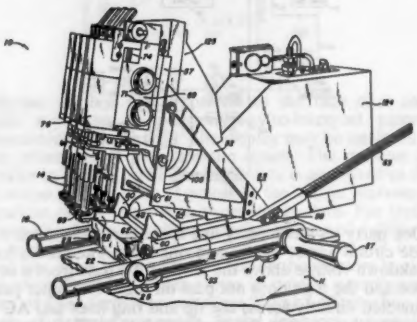
An apparatus is provided for making a double-layer reinforcing cage for concrete pipes which permits welding of longitudinally oriented steel bars and circumferentially oriented steel bars of an outer reinforcing cage member and simultaneously and respectively the longitudinally oriented steel bars and circumferentially oriented steel bars of an inner reinforcing cage member. The apparatus comprises a rotor and a feed plate for moving the longitudinally oriented steel bars rotatably mounted on a hollow stationary pipe, and two sets of longitudinally oriented steel rod guide lines for the outer reinforcing cage member and the inner reinforcing cage member respectively are mounted in the periphery of the rotor in such a manner that the two sets of guide lines are spaced apart from each other a predetermined distance, radially of the rotor. A welder for the inner reinforcing cage member and means for supplying circumferentially oriented steel bars to the inner reinforcing cage member are mounted at one end of said hollow stationary pipe.

3,579,260

MACHINE FOR WELDING STUDS TO BEAMS

Lewis J. Logan, 11820 Edgewater Drive, Lakewood, 7, Ohio

Continuation-in-part of application Ser. No. 223,457, Sept. 13, 1962, now abandoned. This application July 28, 1965, Ser. No. 477,652
Int. Cl. B23k *9/20*
U.S. Cl. 219—98 8 Claims



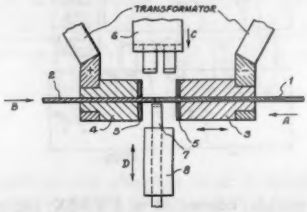
A welding machine for simultaneously welding a plurality of studs on a beam (particularly an I-beam) comprising a frame with front and rear wheels for engaging the beam. A plurality of welding heads are mounted on a supporting means and each head includes a chuck for holding a stud; means for moving the chuck away from the beam; means for moving the chuck toward the beam; and, means for supplying electric power to the chuck. The heads are mounted for vertical and horizontal adjustment relative to the frame. Guide means are provided between the machine and the beam to properly orient the machine relative thereto and means are provided for raising and lowering said heads and supporting means as a unit relative to the wheels of the machine.

3,579,261

MAKING OF RIVET HEAD BIMETALLIC ELECTRICAL CONTACTS

Hans Wacker, Heidelberg, Germany, assignor to Renz Wacker & Co., Maschinen-u Kettenfabrik

Filed Oct. 14, 1968, Ser. No. 767,321
Claims priority, application Germany, Oct. 12, 1967, P 16 26 696.3
Int. Cl. B21j *5/06;* H05b *1/00*
U.S. Cl. 219—154 7 Claims

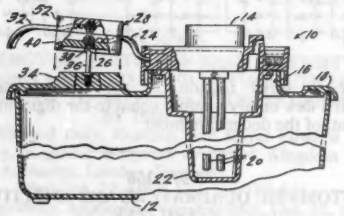


A rivet head is formed on a bimetallic electrical contact wire by striking one end of the wire with flat surfaced cam means while retarding the advance of the wire by spring-loaded cam means.

3,579,262
ELECTRIC STEAM VAPORIZER

Donald J. Peeps, Rossford, Ohio, assignor to Champion Spark Plug Company, Toledo, Ohio

Filed May 22, 1968, Ser. No. 731,124
Int. Cl. H05b 3/60
U.S. Cl. 219—295 4 Claims

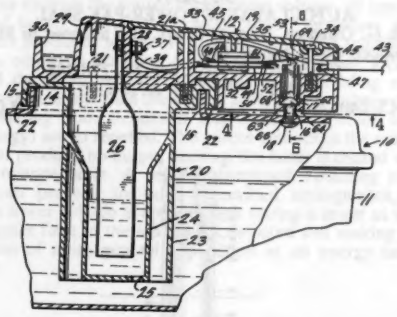


A safety device for a steam vaporizer having a liquid reservoir base with a removable top. A pair of electrodes depend from the top into the reservoir base for heating a liquid. To remove the top from the base, spaced terminals provided in a terminal block must be disengaged from shorting conductors on the base reservoir, thereby opening the power circuit to the electrodes, In one embodiment, the terminal block is an integral part of the top. In another embodiment, the block is secured to the top by connector cord of such length that the block terminals must be disengaged from the shorting conductors in order to remove the top with its dependent electrodes from the base.

3,579,263
ELECTRIC STEAM VAPORIZER

William H. Corbett; Albert D. Brunell, and George M. Koharchik, Somerset, Pa., assignors to The DeVilbiss Company and Champion Spark Plug Company, Toledo, Ohio

Filed Nov. 25, 1968, Ser. No. 778,685
Int. Cl. H05b 3/60
U.S. Cl. 219—295 9 Claims

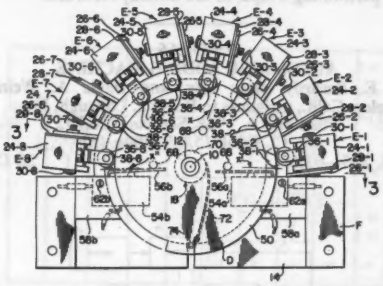


An electric steam vaporizer having a liquid reservoir and a removable top. A post member is mounted on the upper part of the liquid reservoir. The top has an opening in one side which receives the post member when the top is placed on the reservoir. The post member actuates a switch which closes an electrical circuit to the vaporizer electrodes. The post also mechanically locks the top to the reservoir thus minimizing possible heated water injuries in the event of vaporizer overturning.

3,579,264
REVERSIBLE PROGRAMMER FOR ELECTRIC CIRCUITS

George B. Mork, Baraboo, Wis., and Donald J. Morse, Davenport, Iowa, assignors to Gulf & Western Industries, New York, N.Y.

Filed Oct. 24, 1968, Ser. No. 770,332
Int. Cl. H05b 1/02
U.S. Cl. 219—486 8 Claims

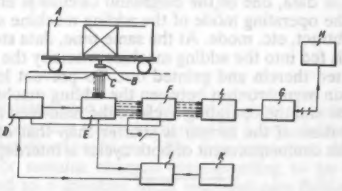


An improved reversible programmer having a regulated control sequence in both a forward and reverse direction. The programmer includes a plurality of actuatable control switches and a generally arcuate rotatable cam for sequentially actuating the control switches. A thermally controlled motor means is provided to drive the cam in a forward direction thereby actuating the control switches to energize electrical circuits, or to drive the cam in a reverse direction whereby the control switches are disengaged and the circuit deenergized. A pair of limit switch means are employed for deenergizing the motor means when the cam reaches a specific location. In addition, a clutch means is used to drivingly connect the cam to the motor means.

3,579,265
METHOD AND APPARATUS FOR TRANSMITTING INFORMATION

Jozsef Mandzsu, and Erno Csaszar, Budapest, Hungary, assignors to Fok-Gyem Finommechanikai Es Elektronikus Muszergyarto, Budapest, Hungary

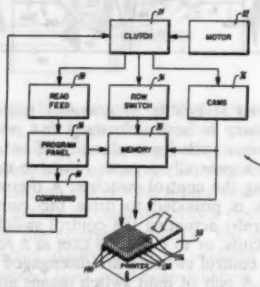
Filed May 10, 1968, Ser. No. 728,183
Claims priority, application Hungary, May 10, 1967, Ma-1711
Int. Cl. G06k 7/08; B61l 27/04
U.S. Cl. 235—61.11 9 Claims



Method and apparatus for transmitting information between a track bound vehicle and a point on the track whereby the desired information is provided independent of the speed and direction of the travelling vehicle. The signal transmitter is coded according to the desired information, for example, the identifying number of the vehicle, by the selective positioning of a plurality of magnets within a matrix of positions, while the receiver is provided with a plurality of magnetically operated switches, for example, Reed-switches, one for each possible position of the magnet. The transmitter is also provided with an additional gate magnet which is positioned so that it can cooperate with one of a pair of additional magnetic switches provided in the receiver depending

on the direction of travel of the vehicle. Actuation of either of these additional magnetic switches causes signals to be simultaneously emitted in parallel from each of the other magnetic switches closed in accordance with the transmitted coded signal. The output signals from the closed magnetic switches are fed to a code converter which, depending on which one of the additional magnetic switches was actuated, provides a binary coded output signal which either represents the actual detected numerical value or its compliment. The coded output signals are then either placed in an intermediate store and subsequently read or recorded, for example, by perforating a tape, or are directly recorded.

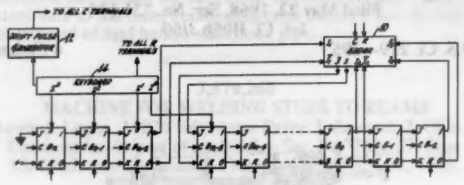
3,579,266
AUTOMATIC ADDING MACHINE
James E. Berardy, Daly City, and David A. Weinstein, Berkeley, Calif., assignors to Rollin J. Lobaugh, Inc.
Filed May 6, 1968, Ser. No. 726,772
Int. Cl. G06k 15/02; H04q 1/00
U.S. Cl. 235—61.6 **33 Claims**



An automatic adding machine for reading, accumulating, and printing data from media such as punched tape and cards, magnetic tape and the like. A read and feed mechanism sequentially decodes the data from the media and transmits data responsive signals to a matrix where all data from a set of data such as a punched card is stored. An adding machine or like accumulation device is coupled with the matrix sand has a plurality of electrically actuated digit keys. The matrix includes a memory cell for each digit key. Electric command circuits are responsive to data decoded by the read and feed mechanism, are synchronized therewith and include a second memory system which permits storage of command signals from the read and feed mechanism so that the command data can be read prior to the reading of the data stored in the matrix. Upon completion of the reading of the set of data, one of the command circuits is energized to select the operating mode of the adding machine such as the add, subtract, etc. mode. At the same time, data stored in the matrix is fed into the adding machine whereby the data is accumulated therein and printed out. To prevent loss of data due to an asynchronism between the adding machine operating cycle and the operating cycle of the read-feed mechanism the duration of the former is shorter than that of the latter while the commencement of both cycles is interdependent.

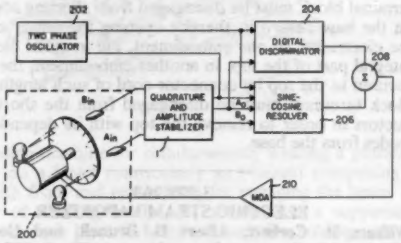
3,579,267
DECIMAL TO BINARY CONVERSION
Carl Macey Wright, Cinnaminson, N.J., assignor to RCA Corporation
Filed Sept. 24, 1969, Ser. No. 860,592
Int. Cl. H03k 13/24
U.S. Cl. 235—155 **4 Claims**

Successive 4-bit numbers representing successive decimal digits in decreasing order of significance are inserted into one portion of a register means. During each period between the insertion of one 4-bit number and the next, the bits are shifted stage-to-stage and an adder serially adds the bit stored in one stage of said one portion of the register means to bits stored in two other stages of the register means. The selection of stages is such as to cause to be added to each new decimal digit, the two multiple and the eight multiple of a binary number representing all previously applied decimal digits. The successive sum bits produced by the adder are



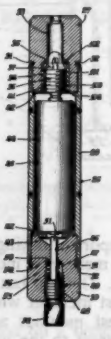
returned, in serial fashion, to the register means and represent a new binary number equal to the digits inserted, to that point, of the decimal number.

3,579,268
AUTOMATIC QUADRATURE AND AMPLITUDE STABILIZER
Richard J. Steiger, Berkeley, Calif., assignor to Ampex Corporation, Redwood City, Calif.
Filed July 9, 1968, Ser. No. 743,555
Int. Cl. G06g 7/22
U.S. Cl. 235—189 **5 Claims**



A network adapted to receive two phase related signals and generate two responsive quadrature related signals. One received signal serves as a reference. A servocontrolled percentage of the reference signal is mixed with the other received signal to form a resultant third signal which is quadrature relative to the reference signal.

3,579,269
AUTOCLAVABLE POWER-PAK SEAL
Ralph G. Ostensen, Morton Grove, Ill., assignor to Medical Products Corp., Skokie, Ill.
Filed Nov. 22, 1968, Ser. No. 778,288
Int. Cl. F21l 7/00; A61b 1/06
U.S. Cl. 240—10.68 **9 Claims**



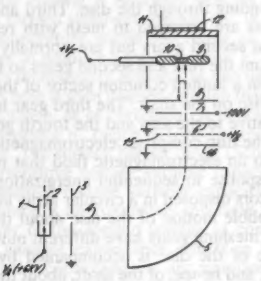
Autoclavable power-pak having a bore in a stainless steel casing housing a lens-end light bulb with an externally

threaded base, a heat and pressure resistant silicone rubber seal comprising a tubular body surrounding the bulb and an integral annular flange extending inwardly from its upper end for resilient engagement with the lens end of the bulb to effect a sealing action, and a brass sleeve threadedly mounted on the base of the bulb to effect a sealing action, and a brass sleeve threadedly mounted on the base of the bulb and having a lower outwardly extending flange engaging the case for electric current transfer purposes and the lower end of the tubular body to effect a second sealing action between the bulb and the casing.

3,579,270
ENERGY SELECTIVE ION BEAM INTENSITY MEASURING APPARATUS AND METHOD UTILIZING A SCINTILLATOR TO DETECT ELECTRONS GENERATED BY THE BEAM

Norman Richard Daly, Reading, and Royal Edward Powell, Newbury, England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Oct. 22, 1968, Ser. No. 769,644
Claims priority, application Great Britain, Oct. 31, 1967, 49529/67
Int. Cl. G01t *1/20*; B01d *59/44*
U.S. Cl. 250—41.9 **13 Claims**



The apparatus is primarily intended for use with ion beams from mass spectrometers, and has one application in determining metastable ion spectra. It comprises a retarding electrode carrying a scintillator detector and preceded by an apertured electrode. When the retarding electrode voltage equals or exceeds the source accelerating voltage, all ions are repelled to the apertured electrode where secondary electrons are produced which are accelerated to the scintillator and an output is obtained from a photomultiplier located beyond the retarding electrode. When the retarding electrode voltage is less than the source accelerating voltage only ions resulting from metastable fragmentations (which have less energy) are so repelled. The parent ions strike the scintillator but produce no output because the latter is coated with an ion-opaque layer. A second, apertured, retarding electrode can precede the above-described arrangement, to which a lower voltage is applied, thus setting a lower as well as an upper limit to the ion energy detected and making the apparatus of more general application as an energy range selector.

3,579,271
METHOD OF MEASURING COATING WEIGHT BY USING STRONTIUM AS A TRACER

Marc Paul Pomerantz, Old Bridge, N.J., assignor to E.I. du Pont de Nemours and Company, Wilmington, Del.

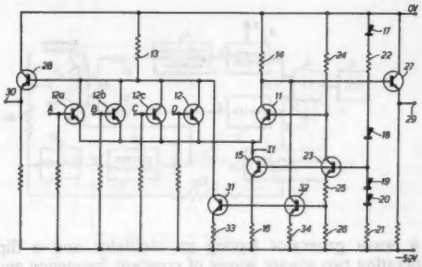
Filed Mar. 18, 1968, Ser. No. 714,090
Int. Cl. G01n *23/22*
U.S. Cl. 250—51.5 **6 Claims**

A process of measuring the dry coating weight of a gelatin coating by adding a given amount of strontium to the coating solution before coating, then analyzing the dried coating to determine the amount of strontium present, thereby, indicating the coating weight.

3,579,272
LOGIC CIRCUITS

Richard Charles Foss, Ilford, Essex, England, assignor to The Plessey Company Limited, Essex, England

Filed Feb. 12, 1969, Ser. No. 798,714
Claims priority, application Great Britain, Feb. 16, 1968, 7833/68
Int. Cl. H03k *19/20*, *1/12*
U.S. Cl. 307—218 **6 Claims**

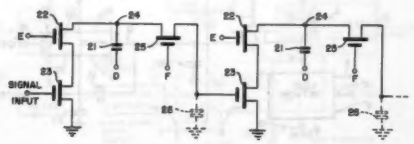


An emitter coupled logic circuit comprises a long-tailed pair switch defined by transistors connected respectively to output transistors in emitter follower configuration. A V_{BE} variation with temperature of said output transistors being compensated for by further transistors whose bases are provided with a constant voltage supply.

3,579,273
DYNAMIC SHIFT REGISTER

Harold D. Cook, Wheaton, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Oct. 1, 1968, Ser. No. 764,247
Int. Cl. G11c *19/00*
U.S. Cl. 307—221 **6 Claims**

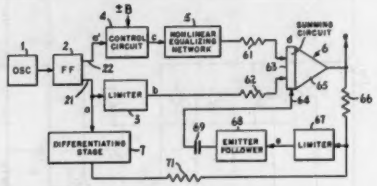


A dynamic integrated circuit MOS shift register includes a first storage capacitor which is charged by a first clock signal to a predetermined voltage. This first capacitor then is discharged or remains charged corresponding to an input signal applied to a shunting MOS insulated-gate field-effect transistor connected in series with a control MOS insulated-gate field-effect transistor having a second clock signal applied to it. The control transistor is rendered conductive by the clock signal and the shunting transistor is rendered conductive by an input signal of one type and remains nonconductive for an input signal of a second type. Thus, the capacitor is discharged only when an input signal of said one type occurs. Following the application of the input signal, a transfer MOS insulated-gate field-effect transistor is rendered conductive by the application of a third clock pulse to transfer the charge on the storage capacitor to the distributed gate-to-substrate capacitance present at the gate of the shunting transistor for the next stage. The charge on the distributed capacitance then constitutes the input for the next stage of the shift register and the cycle is repeated.

3,579,274
GENERATOR FOR PRODUCING TRIANGULAR SIGNALS

Arne Jensen, Havnbjerg, Als, and Tom Kastrup Petersen, Nordborg, Denmark, assignors to Danfoss A/S, Nordorg, Denmark

Filed Aug. 26, 1968, Ser. No. 755,299
Claims priority, application Germany, Aug. 29, 1967, D53955
Int. Cl. H03k 4/06
U.S. Cl. 307—228 9 Claims

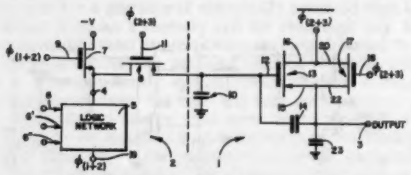


A wave generator having an oscillator and a flip-flop generating two square waves of constant frequency and one of which is varied in amplitude in dependence upon the varying amplitude of a control signal received in a control circuit and the other of which is limited in amplitude by a limiter. The two square waves are applied to and added in a summing circuit and integrated in a differentiating amplifier with a limiter and emitter follower feedback circuit.

3,579,275
ISOLATION CIRCUIT FOR GATING DEVICES

Robert W. Polkinghorn, Huntington Beach; Arthur F. Pfeifer, Whittier; Robert F. Hartmann, Santa Ana, and Robert D. Schull, Mission Viejo, Calif., assignors to North American Rockwell Corporation

Filed Jan. 7, 1969, Ser. No. 789,441
Int. Cl. H03k 17/60, 17/60
U.S. Cl. 307—251 7 Claims



Capacitors are charged during a first recurring interval of time to turn a MOS device on for connecting an output terminal to ground. The MOS devices comprise part of a buffer or isolating circuit which is interposed between a multiphase gating circuit and the output terminal. During a second recurring interval, the capacitors are conditionally discharged as a function of inputs to the multiphase gating device.

If the capacitors were discharged during the second interval the output remains at ground during a third interval. However, if the capacitors were not discharged, the output is driven to a voltage level from a clock source. The change in the voltage at the output terminal is fed back through one of the capacitors to the gate electrode of the MOS device for driving the output to approximately the voltage level of the clock source.

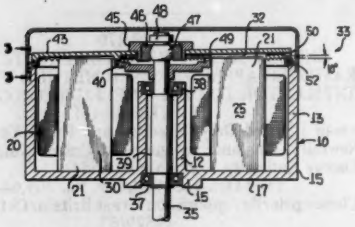
Since the MOS device is turned on completely, any positive noise on the output of the circuit is neutralized by the current through the MOS device.

A second MOS device may be connected in parallel with the first device to permit the capacitor to be completely discharged to ground during the second interval.

3,579,276
HARMONIC DRIVE FOR DIGITAL STEP MOTOR

Harold R. Newell, South Newbury, N.H., assignor to Mesur-Matic Electronics Corporation, Warner, N.H.

Filed Mar. 31, 1967, Ser. No. 627,410
Int. Cl. H02k 7/06
U.S. Cl. 310—82 7 Claims

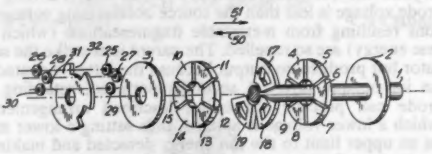


A step motor has first and second circular coaxial gears mounted on a rotor disc for pivoting and rotation relative to a shaft extending through the disc. Third and fourth circular coaxial gears are arranged to mesh with respective ones of the first and second gears but are normally separated along the shaft from the first and second gears so that meshing can occur only in a limited common sector of the gears upon tilting of the disc on the shaft. The third gear is fastened irrotationally relative to the axis and the fourth gear is fastened to the shaft. The disc comprises electromagnetic material and is subjected to an electromagnetic field that rotates about the shaft, in response to sequential energization of electromagnetic actuators disposed in a circular array about the shaft, to produce wobble motion of the disc about the shaft. At least one pair of meshing gears have different numbers of teeth so that wobble of the disc is accompanied by rotation of the fourth gear, and hence, of the shaft, about the axis.

3,579,277
BRUSHLESS DIRECT CURRENT MOTOR

Issei Imahashi, Suwa-shi, Japan, assignor to Kabushiki Kaisha Suwa Seikosha

Filed Apr. 29, 1969, Ser. No. 820,200
Claims priority, application Japan, Apr. 30, 1968, 43/28687
Int. Cl. H02k 21/00
U.S. Cl. 310—156 5 Claims

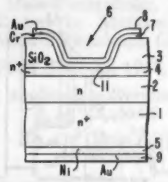


In brushless direct current motors having pairs of axially spaced permanent magnets radially arranged about and fixed to a rotor shaft, driving coils disposed in the space between said pairs of permanent magnets and detecting means including detecting coils, and a shield ring having cutaway portions in the path of said detecting coil for the operation of each detecting coil when said cutaway portions are aligned therewith for the activation of the driving coil associated with said detecting coil; the improvement of mounting the driving coils in apertures in an insulated board at an angular interval of about 100° and forming said board with a notch extending from the edge thereof to the center of said driving coils to permit removal of said rotor shaft.

3,579,278
SURFACE BARRIER DIODE HAVING A HYPERSENSITIVE n+ REGION FORMING A HYPERSENSITIVE VOLTAGE VARIABLE CAPACITOR

John Heer, West Newbury, Mass., assignor to Varian Associates, Palo Alto, Calif.

Filed Oct. 12, 1967, Ser. No. 674,821
Int. Cl. H01l *3/00*
U.S. Cl. 317—234 3 Claims

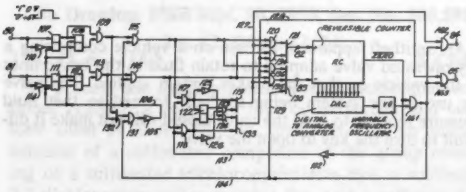


A surface barrier diode, also known as a Schottky diode, is disclosed having a hypersensitive voltage variable capacitance. The surface barrier diode structure comprises a silicon wafer of n^+ conductivity having an N-type epitaxial layer which is oxidized on its outer surface to form a silicon oxide layer overlaying the epitaxial n-region of the wafer. The silicon oxide coating is relatively thin, as of less than 5000 A., and is formed relatively quickly i.e., in less than 20 minutes at a temperature within the range of 1150° C. to 1250° C. in order to produce a hypersensitive n^+ impurity accumulation layer immediately adjacent to and underlying the oxide coating. A hole is then opened through the silicon layer and a metal electrode, as of chromium, is deposited directly upon the hypersensitive n^+ region to form the rectifying junction of the diode. The surface barrier diode (Schottky diode) exhibits a hypersensitive voltage variable capacitance effect where "hypersensitive voltage variable capacitance" means that the capacitance is approximately inversely proportional to the first power of the applied voltage as contrasted with normal voltage variable capacitance effects in PN junction devices wherein the capacitance is approximately inversely proportional to the one-half or one-third power of the applied voltage.

3,579,279
STEP MOTOR ACCELERATION-DECELERATION CONTROL SYSTEM

Seluemon Inaba, Kawasaki-shi; Kanryo Shimizu, Tokyo; Yoshihiro Hashimoto, Yokohama-shi, and Kengo Kobayashi, Kawasaki-shi, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 15, 1969, Ser. No. 824,897
Claims priority, application Japan, May 16, 1968, 43-33240
Int. Cl. H02v *37/00*
U.S. Cl. 318—696 7 Claims

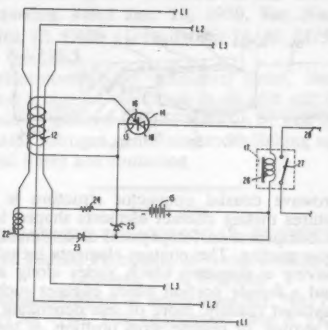


A pulse control circuit is connected between the pulse supply for supplying a train of control pulses to a step motor and the motor. The pulse control circuit gradually increases the frequency of pulses in the beginning of the pulse train and gradually decreases the frequency of pulses in the end of the pulse train thereby enabling proper starting and stopping of a motor operating at high speed.

3,579,280
ELECTRICAL GROUND FAULT DETECTOR WITH TRANSFORMER COUPLING, A BATTERY SUPPLY SOURCE AND BATTERY CHARGING MEANS

Douglas A. Florance, Vestal, and Lloyd P. Nordholm, Binghamton, N.Y., assignors to Flo-Root, Inc., Village of Endicott, N.Y.

Filed May 19, 1969, Ser. No. 825,911
Int. Cl. G01r *31/02*
U.S. Cl. 324—51 1 Claim

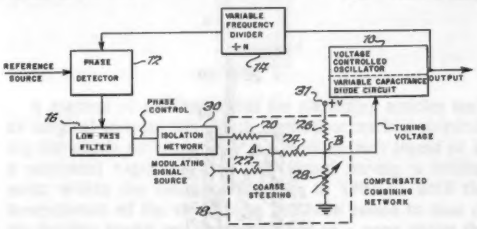


A ground fault detector applied to an electrical supply system is disclosed. It utilizes a ring-type current transformer, a battery power source, and a solid-state control device operable by preselected current imbalance to energize an alarm. In addition, a modification of the apparatus includes a charging circuit inductively coupled to a branch of the monitored electrical supply to maintain the capability of the battery.

3,579,281
COMBINING NETWORK PROVIDING COMPENSATED TUNING VOLTAGE FOR VARACTOR

George H. Kam, Tonawanda, and Richard J. Hughes, Williamsville,, N.Y., assignors to Sierra Research Corporation

Filed June 4, 1969, Ser. No. 830,290
Int. Cl. H03c *3/22*
U.S. Cl. 332—30V 9 Claims

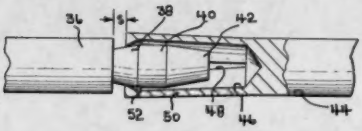


A control circuit for an indirect frequency synthesizer which combines a plurality of control functions into a single compensated tuning voltage for the varactor control element of an associated voltage controlled oscillator. The combining circuit includes a resistor network for summing phase control and modulating signals, and a variable resistance circuit for generating a coarse steering signal. The summing network is resistively connected to the variable resistance circuit to form a variable impedance resistor divider operative to attenuate the combined phase control and modulating signals in a manner inversely related to the magnitude of the coarse steering signal and to combine the attenuated control signals with the coarse steering signal and to combine the attenuated control signals with the coarse steering voltage to provide the varactor tuning signal. More specifically, the attenuation provided by the impedance divider is operative to substantially compensate for the variation in voltage versus frequency sensitivity of the varactor with changes in the coarse steering voltage.

3,579,282
TRANSMISSION LINE CONNECTOR WITH MEANS INCLUDING CAM SURFACES FOR ALTERING CONNECTOR ELEMENT DIMENSIONS TO COMPENSATE FOR JUNCTION GAPS, AND METHOD THEREFOR

William Dean Couper, Palmyra, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 3, 1969, Ser. No. 788,812
Int. Cl. H01p 1/00, 5/08
U.S. Cl. 333—97 6 Claims



A microwave coaxial connector structure is disclosed which features mating contact elements shaped to provide automatic compensation for physical discontinuities caused by improper mating. The contact elements include a male portion having a diameter which varies along a segment thereof and a female portion which engages such segment and is displaced radially, more or less depending upon the degree of seating, or relative axial position, of the segment within the female portion. If contact elements are not fully seated a high impedance mismatch is caused by a radial gap therebetween. The invention structure operates to create a counterbalancing low impedance due to the radial expansion of the mating element. The balancing low impedance is made to be physically close to the high impedance relative to signal wavelength. The invention is also taught in a reverse structure for outer conductive mating parts of a connector.

3,579,283
CAM GRIP FLAT CONDUCTOR CONNECTOR

Norman Welburn, Watford, England, assignor to AMP Incorporated, Harrisburg, Pa.

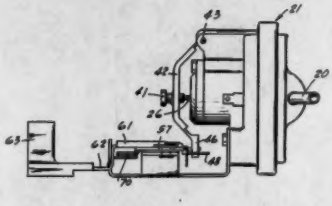
Filed Oct. 4, 1968, Ser. No. 765,221
Claims priority, application Great Britain, Oct. 12, 1967, 46563/67
Int. Cl. H01r 9/08
U.S. Cl. 339—217 2 Claims

An electrical connector primarily for flat conductor cable uses a spring-loaded cam to provide backup pressure between a conductor of the cable and a contact in the connector.

3,579,284
RESET AND ADJUSTMENT MECHANISM FOR A PRESSURE-RESPONSIVE SWITCH

Anthony Mason, Benton Harbor, and Clifton A. Cobb, St. Joseph, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed July 1, 1968, Ser. No. 741,763
Int. Cl. H01h 35/40
U.S. Cl. 200—83 6 Claims

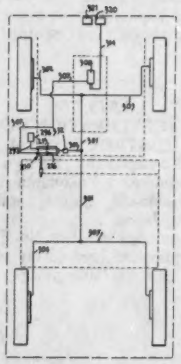


A pressure-responsive switch assembly of the type used, for example, as a liquid level control in washing machines, including a slide means which is operable to automatically reset the diaphragm of the pressure-responsive switch when an adjustment is to be made of the operating point of the switch by advancing to a higher setting.

3,579,285
HYDRAULIC ANTITHEFT SYSTEM FOR VEHICLES

Emile Joseph-Henri Verdier, St. Laurent, Quebec, Canada, assignor to Aktiebolaget Bofors, Bofors, Sweden

Continuation-in-part of application Ser. No. 452,125, Apr. 30, 1965. This application July 18, 1968, Ser. No. 751,668
Claims priority, application Canada, May 8, 1964, 902,304
Int. Cl. B60r 25/08
U.S. Cl. 307—10 12 Claims



An antitheft apparatus for use on a vehicle comprising a key operated valve adapted to retain fluid in the brake lines of the vehicle so that the brakes remain applied. The valve for use in the system being specially formed so that fluid pressure tending to hold the valve closed will not make it difficult to turn the key to open the valve.

CHEMICAL

3,579,286

POLYALKYLENE POLYAMINE THIOSULFONATED SULFUR DYE COMPOSITION AND DYEING THEREWITH

Christian Heid, Frankfurt am Main-Fechenheim, Willi Gunzert, Frankfurt am Main, and Fritz Engelhardt, Frankfurt am Main-Fechenheim, Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft Frankfurt am Main-Fechenheim, Germany

No Drawing. Filed Aug. 23, 1968, Ser. No. 753,998

Claims priority, application Germany, Aug. 27, 1967, P 16 19 404.0

Int. Cl. D06p *1/30*

U.S. Cl. 8—37 9 Claims

Thiosulfonate forms of sulfur dyes are fixed on cellulosic fibers by merely drying the fibers after they have been impregnated with the dye and with a polyalkylene polyamide having at least three primary or secondary amine groups and in which the alkylene groups have two to four carbons.

3,579,287

BLEACHING PROCESS

Xavier Kowalski, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed June 11, 1969, Ser. No. 832,437

Int. Cl. D06l *3/06*

U.S. Cl. 8—108 5 Claims

Textile fibers bleached with solutions of chlorocyanuric acids, salts or complexes are soured by contact with an aqueous acidic solution containing hydroxy ethylidene diphosphonic acid, sodium hexametaphosphate, ethylene diamine tetraacetic acid, nitrilotriacetic acid, alkali metal salts of the foregoing acids or mixtures of these compounds as well as the sulfite salts conventionally utilized in souring solutions. The process provides fibers characterized by improved appearance and reduced heat sensitivity.

3,579,288

PERMSELECTIVE CELLULOSE MEMBRANES REACTED WITH A SULFONATED TRICHLOROPYRIMIDINE DYE, 2,3 - DICHLOROQUINOXALINE DYE OR DICHLORO-s-TRIOZINES

Adalbert Suszer, Jerusalem, Israel, assignor to the State of Israel as represented by the Prime Minister's Office, Jerusalem, Israel

No Drawing. Filed Sept. 20, 1966, Ser. No. 580,595

Int. Cl. D06m *13/34*

U.S. Cl. 8—116.2 5 Claims

A process for making permselective membranes comprises reacting a cellulosic film or parchmentized cellulosic sheet of about 0.1 mm. thickness with an aqueous solution of a sulfonated compound of the group consisting of a sulfonated trichloropyrimidine dye, a sulfonated 2,3-dichloroquinoxaline reactive dye, and a sulfonated dichloro-s-triazine, in high concentration for a period of time in the order of at least three hours until said cellulosic film or sheet is converted to a permselective membrane exhibiting permselectivity exceeding 14 mv. in a cell containing N/10 to N/20 potassium chloride, and exhibiting an electrical resistance of less than 20 ohms/cm.^{2}.

3,579,289

ACID SALT FORM OF DEAE CELLULOSIC FABRIC PROVIDING BUILT-IN CATALYSIS FOR THE REACTION WITH AMINOPLASTS

Donald M. Soignet, Metairie, and Ruth R. Benerito, New Orleans, La., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Jan. 16, 1970, Ser. No. 3,514

Int. Cl. C08b *11/20;* D06m *13/40, 13/54*

U.S. Cl. 8—116.3 7 Claims

Diethylaminoethylated cellulosic fibers, the diethylaminoethyl groups of which are in an acid salt form, provide a built-in catalyst for the reaction of said fibers with methylolated nitrogen containing cross-linking agents with which said fibers are contacted.

3,579,290

STERILISATION OF SURGICAL INSTRUMENTS

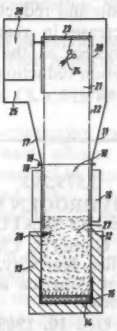
Richard Esdaile Pickstone, 36 Avon Trading Estate, London, W. 4, England

Continuation-in-part of application Ser. No. 713,395, Mar. 15, 1968. This application June 8, 1970, Ser. No. 44,018

Claims priority, application Great Britain, Mar. 16, 1967, 12,419/67

Int. Cl. A61l *1/00, 3/00*

U.S. Cl. 21—2 20 Claims



A method of and apparatus for sterilizing articles such as surgical instruments which method comprises suspending the object or instrument in a boiling inert liquid or in a saturated vapor thereof, said liquid having a boiling point within the range of 160° C. to 190° C. until the temperature of the said object has been raised to that of the boiling liquid and then raising it to a zone above the vapor of the boiling liquid until adhering liquid has evaporated under the sensible heat of the instrument.

3,579,291

REMOVING PHENYL AZIDE FROM GASES

Winfried Ludwig and Rudolf Oster, Ludwigshafen, and Hans Urbach, Lampertheim, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Dec. 3, 1969, Ser. No. 881,898

Claims priority, application Germany, Dec. 13, 1968, P 18 14 493.9

Int. Cl. B01d *47/02*

U.S. Cl. 23—2 3 Claims

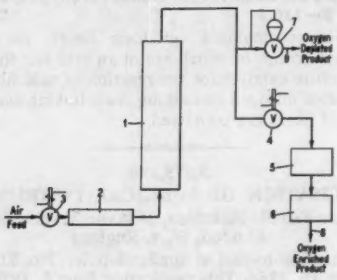
A process for removing phenyl azide from gas by passing the gas containing phenyl azide through 50 to 100 wt. percent sulfuric acid.

3,579,292

PROCESS AND COMPOSITION FOR SEPARATION OF OXYGEN FROM AIR USING STRONTIUM OXIDE-PEROXIDE AS THE CARRIER

Joseph T. Mullhaupt, Tonawanda, and Silviu A. Stern, De Witt, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jan. 8, 1969, Ser. No. 789,908
Int. Cl. B01d *53/34*; C01b *13/08, 15/04*
U.S. Cl. 23—2 22 Claims



By incorporating at least one ion of a metal from Groups I–A, I–B and VIII of the Deming Periodic Table into a strontium oxide-peroxide reaction mass, a great increase in the oxidation and reduction rates of the mass is obtained. This increase in reaction rates makes it feasible to use this system as the oxygen carrier in a cyclic, reversible oxidation-reduction process for the separation of oxygen from air.

3,579,293

REMOVAL OF HYDROGEN SULFIDE FROM GASEOUS MIXTURES

Forrest G. Shultz and Gerald E. Chidester, Morgantown, and Fernand E. Collet, Star City, W. Va., assignors to the United States of America as represented by the Secretary of the Interior

No Drawing. Filed Oct. 10, 1969, Ser. No. 865,535
Int. Cl. B01d *53/14*
U.S. Cl. 23—2S 3 Claims

Hydrogen sulfide is removed from gaseous mixtures by contacting the mixtures at elevated temperature with an absorbent comprising iron oxide and fly ash.

3,579,294

PROCESS FOR EXTRACTION OF ALUMINA FROM ORES BY SOLUTION OF CAUSTIC SODA AND SODIUM ALUMINATE

Louis Tamisé, Douvres-la-Delivrande, and Jacques Millet, Versailles, France, assignors to Pechiney-Compagnie de Produits Chimiques et Electrometallurgiques, Paris, and Societe Appareils et Evaporateurs Kestner, Lille, France

Filed Mar. 15, 1968, Ser. No. 713,421
Claims priority, application France, Mar. 20, 1967, 99,393
Int. Cl. C01f *7/02*
U.S. Cl. 23—52 10 Claims

Process and equipment for the continuous extraction of alumina from bauxite by dissolution in aqueous caustic soda and sodium aluminate solutions in which use is made of a plurality of autoclaves of increasing temperature through which the suspension flows in series from one to the next in a sequence of stages and a plurality of expansion vessels of decreasing pressure in series with the autoclaves and through which the suspension flows in series.

3,579,295

PROCESS FOR ATTACK OF BAUXITE WITH ALKALINE SOLUTION

Louis Tamisé, Douvres-la-Delivrande, and Jacques Millet, Versailles, France, assignors to Pechiney Compagnie de Produits Chimiques et Electrometallurgiques, Paris, and Societe Appareils et Evaporateurs Kestner, Lille, France

Filed Mar. 15, 1968, Ser. No. 713,422
Claims priority, application France, Mar. 20, 1967, 99,394
Int. Cl. C01f *7/02*
U.S. Cl. 23—52 9 Claims

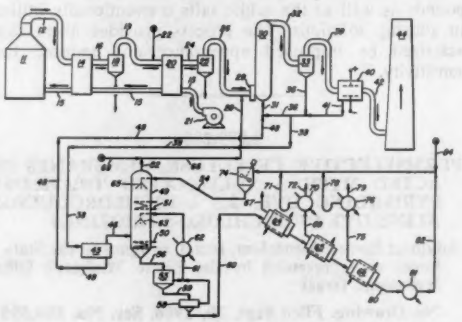
A process for the continuous attack of ores containing alumina with an aqueous solution of caustic soda and sodium aluminate in which use is made of a series of stages each having an autoclave with the autoclaves increasing in temperature from stage to stage in the direction of flow of the suspension with the autoclave in one stage receiving suspension from the preceding stage and expansion vessels with the expansion vessels decreasing in pressure in countercurrent relation with the autoclaves of increasing temperature.

3,579,296

DUAL CYCLE TREATMENT OF SULFUR DIOXIDE CONTAINING FLUE GAS AND THE LIKE

Everett Douglas Cann, Freeport, Ill., assignor of fractional part interest to William T. Neiman

Filed Nov. 13, 1967, Ser. No. 682,435
Int. Cl. C01b *17/60*
U.S. Cl. 23—178 11 Claims



A method is provided for treating flue gas and the like for sulfur dioxide removal and recovery. The gas, containing a minor but polluting amount of sulfur dioxide and substantially no sulfur trioxide, is contacted with ammonia in the presence of water to form an ammonium sulfite. This is separated and, in the absence of oxygen, reacted with an aqueous alkaline earth metal oxide or with zinc oxide to liberate the ammonia for recycle and to form insoluble alkaline earth metal or zinc sulfite. The latter is dried, dehydrated, and thermally decomposed to liberate a concentrated stream of sulfur dioxide and to form alkaline earth metal oxide or zinc oxide for recycle. Procedures are disclosed for efficiently conducting the above processing steps and operations.

3,579,297
PROCESS OF MANUFACTURING AMMONIUM SALTS
Karl Gote Ekblom, Ljungaverk, Sweden, assignor to Fosfatbolaget AB, Stockholm, Sweden
Filed June 18, 1968, Ser. No. 738,033
Claims priority, application Sweden, Sept. 15, 1967, 12,742/67
Int. Cl. C01c *1/18, 1/28*
U.S. Cl. 23—103 4 Claims

This invention relates to a method for controlling the reaction between ammonia and acid so as to minimize the formation of excess ammonia, which comprises withdrawing some vapor from the reaction zone, dividing said vapor into two streams, contacting it with an acid compound in excess of that needed to neutralize the free ammonia in the stream, cooling each stream to form an aqueous condensate, measuring the conductivity of each condensate, and regulating the introduction of reactants to the reaction zone in accordance with said conductivity measurements.

3,579,298
PRODUCTION OF AMMONIUM NITRATE
George O'Brien and John S. Hubby, Bartlesville, Okla., assignors to Phillips Petroleum Company
Filed Aug. 5, 1968, Ser. No. 750,327
Int. Cl. C01c *1/18*
U.S. Cl. 23—103 3 Claims

An aqueous stream comprising essentially water and a minor amount of ammonia is reacted with at least enough nitric acid to produce an ammonia-free water stream containing a minor amount of ammonium nitrate, and then utilizing said ammonium nitrate-containing stream to absorb at least a portion of nitrogen dioxide gas to produce nitric acid containing a minor amount of ammonium nitrate.

3,579,299
POROUS SILICATE
Robert H. Sams, Aldan, and Newton W. McCready, Newtown Square, Pa., assignors to Philadelphia Quartz Company, Philadelphia, Pa.
No Drawing. Continuation-in-part of application Ser. No. 540,204, Apr. 5, 1966. This application July 30, 1968, Ser. No. 748,644
Int. Cl. C01b *33/00;* C11d *3/04*
U.S. Cl. 23—110A 6 Claims

A low bulk density, crystallized, alkaline sodium silicate or a detergent containing a low bulk density, crystallized, alkaline sodium silicate is formed by the addition of powdered silicon metal to a crystallizing mass of the alkaline sodium silicate to produce a foramenifcrous product of uniform porosity.

3,579,300
CONTINUOUS PROCESS FOR THE PRODUCTION OF CALCIUM SULPHATE HEMI-HYDRATE FROM GYPSUM
Martin S. Bloom, Norton-on-Tees, and Martin Granger Brown, Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England
Continuation-in-part of abandoned application Ser. No. 414,244, Nov. 27, 1964. This application Aug. 4, 1969, Ser. No. 847,022
Claims priority, application Great Britain, Dec. 3, 1963, 47,675/63
Int. Cl. C01f *11/46*
U.S. Cl. 23—122 6 Claims

Process for producing calcium sulphate alpha-hemihydrate by subjecting a slurry of gypsum and water to superatmospheric pressure sufficient to maintain the water in the liquid state at a preselected mean temperature of at least 130° C., continuously passing the said slurry into a reactor having an inlet and an outlet, injecting into said slurry sufficient steam at a pressure and temperature sufficient to maintain said slurry in the reactor at least at said superatmospheric pressure and preselected mean temperature, continuously agitating said slurry in reactor, and continuously withdrawing calcium sulphate alpha-hemihydrate from the outlet without reducing the pressure therein.

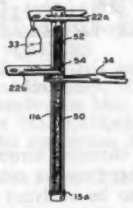
3,579,301
CONDENSED PHOSPHORIC ACID HAVING REDUCED VISCOSITY
Robert A. Wiesboeck, Atlanta, and Charles C. Stone, Doraville, Ga., assignors to United States Steel Corporation, Pittsburgh, Pa.
Filed June 28, 1968, Ser. No. 740,918
Int. Cl. C01b *25/24*
U.S. Cl. 23—165 7 Claims

To reduce the viscosity of condensed phosphoric acids so that they can be pumped or otherwise readily handled or treated, the F content of the acids is raised above two percent and preferably above four percent. The fluorine may be added in the form of a fluorine-containing compound, such as fluorophosphoric acid, difluorophosphoric acid, hexafluorophosphoric acid, hydrogen fluoride, etc. The fluorine treatment inhibits crystallization of the acid and, in the case of wet process phosphoric acid containing solids, dissolves solids in the acids.

3,579,302
METHOD OF FORMING SULFUR FROM SO_2-CONTAINING GASES
Verner B. Sefton, Toronto, Ontario, Canada, assignor to Ontario Research Foundation, Sheridan Park, Ontario, Canada
Continuation-in-part of application Ser. No. 722,719, Apr. 19, 1968. This application June 25, 1969, Ser. No. 836,501
Int. Cl. C01b *17/04*
U.S. Cl. 23—226 9 Claims

Hydrogen sulphide-containing gases used to react with sulphur dioxide in a waste effluent gas stream to thereby produce sulphur is generated by reaction between sulphur, a hydrocarbon fuel and steam at high temperatures. The high temperatures necessary for the reaction of sulphur, hydrocarbon fuel which may be the same as or different from that used to form the hydrogen sulphide-containing gases. The sulphur used to form the hydrogen sulphide may be that formed in the reaction of the sulphur dioxide and the hydrogen sulphide-containing gases.

3,579,303
SYSTEM FOR HANDLING SPECIMENS AND OTHER SUBSTANCES IN MEDICINE AND PHYSICAL SCIENCES
Donald E. Pickering, 830 NW. St. Helens Ave., Portland, Oreg. 97229
Filed Mar. 6, 1968, Ser. No. 710,974
Int. Cl. G01n *1/00, 33/16*
U.S. Cl. 23—230 11 Claims



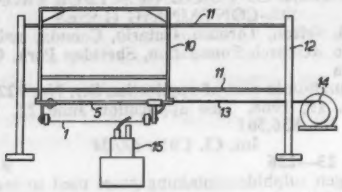
A method of and apparatus for handling, processing, testing, storing, transporting and otherwise using biomedical, biological, chemical and other specimens, re-

agents and substances from the time of their initial procurement through their transport, storage and ultimate laboratory or other usage and final disposal. The system embodies the use of a length of transparent or translucent, resilient, sterile and disposable tubing divided by heat or other seals into a series of linked and sealed segments. Individual segments are severed from the string of segments as needed, filled with a freshly procured specimen or reagent, and then resealed mechanically with a selectively removable clip to which an identification tag can be attached. Additional temporary or permanent sealing of a tube segment can be achieved as needed for separation of substances through the use of additional clips. A modification of the apparatus includes the use of a swab and transport media to procure, contain and transport or store microbiological specimens.

3,579,304
HEAT SCANNED CHROMATOGRAPHIC DETECTOR

Frederick Bolton Padley, Welwyn Garden City, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Apr. 12, 1968, Ser. No. 720,871
Claims priority, application Great Britain, Apr. 21, 1967, 18,448/67
Int. Cl. G01n *31/12*
U.S. Cl. 23—232 **8 Claims**

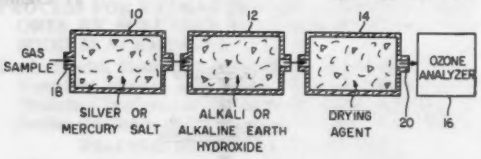


A method of detection particularly suitable to thin layer chromatography in which chemically separated materials on a carrier, produced for example by thin layer chromatographic elution, are scanned and detected by a heat source such as the flame of a flame ionisation detector.

3,579,305
SCRUBBER APPARATUS

Radhakrishna M. Neti, Brea, Calif., assignor to Beckman Instruments, Inc.

Filed July 25, 1968, Ser. No. 747,721
Int. Cl. C09k *3/00;* **G01n** *31/06*
U.S. Cl. 23—232 **3 Claims**

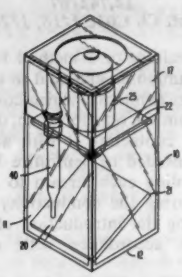


A solid phase chemical scrubber for selectively removing interferrents from an ozone bearing sample gas stream which is to be analyzed for its ozone content. The scrubber contains an alkali or alkaline earth hydroxide, preferably $Ca(OH)_2$ or KOH, which effectively removes both positive and negative interferrents from the gas stream, but does not affect the ozone in the stream.

3,579,306
DIAGNOSTIC TEST DEVICE

Margaret M. Crane, New York, N.Y., assignor to Organon, Inc., West Orange, N.J.

Filed Jan. 22, 1969, Ser. No. 792,936
Int. Cl. A45c *11/00;* **G01n** *21/06, 33/16*
U.S. Cl. 23—253 **10 Claims**

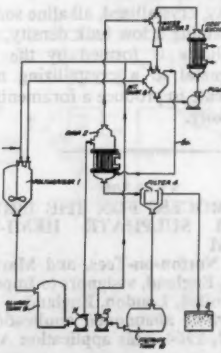


A test kit for the performance of analytical and diagnostic determinations involving visual indication of test results comprises a transparent container having a closure utilizable as a sampling device, a platform supported within the container and having an integral upwardly extending tube supporting a test vial for holding test reagents, and a downwardly extending integral tube guiding and supporting a test dropper, and a mirror set at an angle located in the bottom portion of the container to reflect the results of a test performed within the test vial through the container wall so as to be viewable outside the container.

3,579,307
APPARATUS FOR RECOVERING ACRYLONITRILE MONOMER IN THE PRODUCTION OF A POLYMER

Eiichi Wakita and Kunio Tokumitsu, Fuji-shi, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Original application July 10, 1963, Ser. No. 294,101, Divided and this application Dec. 31, 1968, Ser. No. 788,188
Int. Cl. B01d *3/10;* **B01j** *1/00;* **C07c** *121/30*
U.S. Cl. 23—263 **8 Claims**

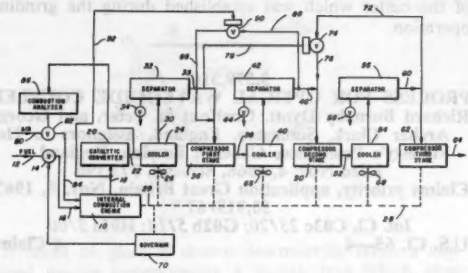


An acrylonitrile polymerizer is connected to an evaporator to recover unpolymerized monomers. A water ejector or jet condenser is connected to the evaporator to recover gaseous monomers therefrom. A tank receives a stream from the ejector or condenser with monomer condensate therein while a filter connected to the evaporator produces a solid filtered material and a filtrate which is fed to the ejector or condenser to form the stream. The tank returns part of the stream and condensate to the polymerizer.

3,579,308
APPARATUS FOR MANUFACTURING HIGH PRESSURE INERT GAS

George H. Gower, Tulsa, Okla., assignor to Inert Gas Corporation, Tulsa, Okla.

Filed Sept. 25, 1969, Ser. No. 860,908
Int. Cl. B01j 7/00
U.S. Cl. 23—281 5 Claims



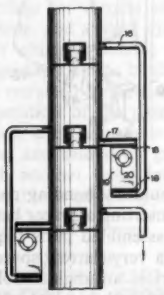
This invention relates to an apparatus for manufacturing high pressure inert gas utilizing hydrocarbon fuel, the gas being produced by the burning of hydrocarbon fuel in an internal combustion engine, the exhaust gases therefrom being conveyed through a catalytic converter whereby substantially inert gas is derived therefrom, and including means of controllably recycling such inert gas through engine driven compressor stages to vary the loading on the engine and thereby vary the inert gas output in response to the demand.

An additional embodiment of the invention includes means to maintain a positive pressure in all portions of the system, including the engine exhaust manifold and catalytic converter, so that any inadvertent leak in the system will not result in air being drawn into the system.

3,579,309
COLUMN FOR CARRYING OUT ORGANIC CHEMICAL REACTIONS IN CONTACT WITH FINE, PARTICULATE CATALYSTS

Kurt Sennewald and Klaus Gehrmann, Knapsack, near Cologne, and Stefan Schafer, Bruhl, near Cologne, Germany, assignors to Knapsack Aktiengesellschaft, Knapsack, near Cologne, Germany

Filed Oct. 7, 1968, Ser. No. 765,337
Claims priority, application Germany, Nov. 18, 1967, P 16 67 139.9
Int. Cl. B01j 9/04; C07c 69/66
U.S. Cl. 23—288 2 Claims



Column for carrying out organic chemical reactions in contact with fine, particulate catalysts, the column being formed with interchangeable, catalyst-receiving rection vessels, which are arranged outside the column, preferably in staggered relationship to each other. between individual column tray outlet and inlet openings projecting outwardly.

3,579,310
PREPARATION OF ACICULAR RUTILE TiO_2

George L. Lewis, Wilmington, and Carl H. Muendel, Centerville, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

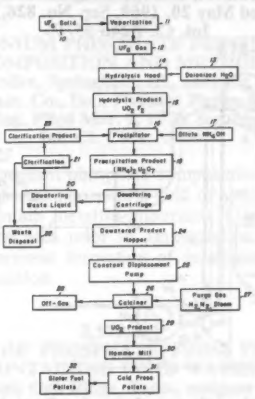
No Drawing. Continuation-in-part of application Ser. No. 624,716, Mar. 21, 1967. This application June 28, 1967, Ser. No. 655,984
Int. Cl. B01d 9/00; C01g 23/08
U.S. Cl. 23—301 11 Claims

Pigmentary single acicular rutile TiO_2 crystals, at least 50% by weight of the particules of which have an average cross-sectional dimension of 0.01 to 0.5 micron and a length-to-cross sectional ratio of 3:1 to 50:1, obtained by calcining at 725–1000° C., a blended titania-salt-promoter mixture made up of preformed TiO_2, a salt comprising sodium chloride, and an oxy-compound of phosphorus (phosphate), and leaching of the calcined product to recover the acicular rutile pigment.

3,579,311
PROCESS AND APPARATUS FOR PRODUCING UO_2 POWDER

John J. McCoy, San Jose, Calif., assignor to General Electric Company

Filed Apr. 25, 1968, Ser. No. 724,119
Int. Cl. C01g 43/02
U.S. Cl. 23—355 12 Claims



An improved process and apparatus for preparing uranium dioxide powder suitable for use in the fabrication of fuel for nuclear reactors. In a process comprising steps of hydrolyzing uranium hexafluoride to form an aqueous uranyl fluoride solution, treating with ammonia to precipitate ammonium diuranate, dewatering and drying the precipitate, and finally calcining the precipitate to form uranium dioxide, the improvement wherein the precipitate is dewatered to about 40% to about 60% by weight, preferably about 50% by weight water and is thereafter directly calcined.

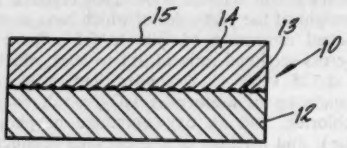
3,579,312
PRINTED CIRCUITS FROM NONMIGRATING SOLDERS

Oliver A. Short, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Original application Mar. 28, 1967, Ser. No. 626,425, now Patent No. 3,472,653, dated Oct. 14, 1969. Divided and this application Apr. 28, 1969, Ser. No. 819,941
Int. Cl. H05k 1/04; C22c 5/00
U.S. Cl. 29—195 5 Claims

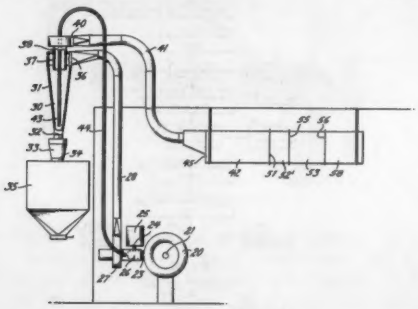
Printed circuits of high reliability fabricated with a non-migrating solder comprising an alloy of gold, tin and germanium. The invention is particularly suitable in circuits with non-migrating conductor compositions.

3,579,313
COMPOSITE OF STEEL AND ALUMINUM CONTAINING ZINC AND BORON, AND A CABLE SHEATH MADE THEREFROM
Michael J. Pryor and William H. Anthony, Hamden, Conn., assignors to Olin Mathieson Chemical Corporation
Filed Oct. 25, 1967, Ser. No. 677,955
Int. Cl. B32b *15/00*
U.S. Cl. 29—196.2 8 Claims



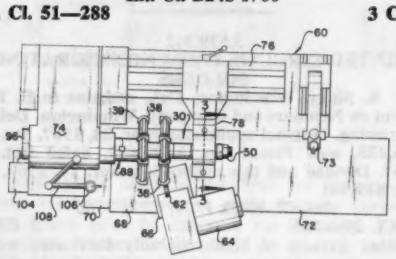
This invention relates to a novel high strength Al–Zn–B alloy metallurgically bonded to steel and heat treating processes therefore, for use in both aerial and underground cable sheathing.

3,579,314
DUST AND SMOKE REMOVAL IN TIRE BUFFING
John J. Cunningham, Jr., Wilmington, Del., assignor to Quinn Brothers, Incorporated, Philadelphia, Pa.
Filed May 20, 1969, Ser. No. 826,165
Int. Cl. B24b *55/06*
U.S. Cl. 51—273 2 Claims



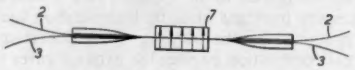
For removing dust and smoke from tire buffing, a cyclone dust collector, a spray chamber and an absolute filter in combination. There is preferably a bypass from a high pressure point in the cyclone dust collector back to a hood adjoining the tire buffing for lengthening the time of a dust and smoke cycle.

3,579,315
METHOD OF PRECISION FORM MILLING
William Rowe Hufendick, Quincy, Ill., assignor to Gardner-Denver Company
Filed May 1, 1968, Ser. No. 725,647
Int. Cl. B24b *1/00*
U.S. Cl. 51—288 3 Claims



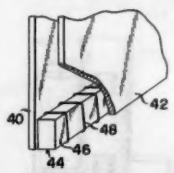
Precision in form milling processes using arbor-type milling cutters is improved by providing a unitary arbor and cutter assembly which is mounted on a cutter grinding machine and rotated for individual cutter tooth forming and sharpening thereby establishing an axis and plane of rotation for each point on the cutter profile. After grinding and sharpening of the cutter teeth, the unitary arbor-cutter assembly is transferred to a milling machine and mounted in a manner duplicating the grinder mounting, thereby exactly preserving the axis and plane of rotation of the cutter which was established during the grinding operation.

3,579,316
PROCESS FOR OPTICAL WAVEGUIDE COUPLER
Richard Burnaby Dyott, Chalfont St. Peter, and George Archer Clark, Stanmore, England, assignors to Her Majesty's Postmaster General, London, England
Filed Nov. 4, 1968, Ser. No. 773,195
Claims priority, application Great Britain, Nov. 8, 1967, 50,919/67
Int. Cl. C03c *23/20*; G02b *5/14*; H01s *3/00*
U.S. Cl. 65—4 4 Claims



A method is disclosed of coupling optical waveguides together for energy transfer from one waveguide to another. The waveguide ends are inserted into a glass capillary tube of refractive index lower than that of the waveguide cladding. The closely proximate ends of the waveguides and the capillary are heated to softening point and then pulled out until the diameter of the sleeve approximates to that of a waveguide.

3,579,317
METHOD OF MUTUALLY BONDING PARTS BY USE OF GLASS
Eizo Goto, Chigasaki-shi, Japan, assignor to Tokyo Shibaura Electric Co. Ltd., Kawasaki-shi, Japan
Filed Nov. 4, 1968, Ser. No. 772,891
Claims priority, application Japan, Nov. 9, 1967, 42/71,689; Nov. 11, 1967, 42/72,215
Int. Cl. C03c *27/00*
U.S. Cl. 65—43 3 Claims



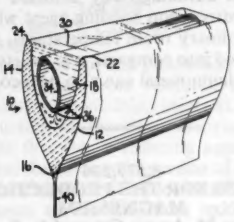
A method of mutually bonding parts with glass layers which comprises inserting a spacer between those portions of a plurality of assembled parts requiring bonding in a manner to define a very narrow space with said portions. The spacer comprises an angular column of either glass or ceramic material with a metal wire wound around it. Contacting the end faces of said portions of the assembly requiring bonding with the surface of an electrically heated molten glass bath and removing the assembly from the bath. The bonding of the assembled parts being due to the cooling into solid layers of the molten glass filled by capillary action into the spaces of said portions requiring bonding.

3,579,318

METHOD OF AND APPARATUS FOR FORMING GLASS SHEETS BY DRAWING DOWNWARDLY

Cecil R. Ward, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 2, 1968, Ser. No. 726,020
Int. Cl. C03b 17/00
U.S. Cl. 65—90 4 Claims



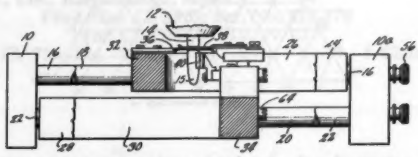
A sheet of glass is drawn downwardly from a contoured nozzle incorporating a trough into which glass is fed through a pipe or conduit from a melter. The glass is extruded upwardly between the inner walls of the nozzle and the feed conduit fills the nozzle and overflows its edges.

3,579,319

ADJUSTABLE SHEAR BLADE AND DROP GUIDE MOUNTING FOR MOLTEN GLASS STRAIGHT LINE SHEARS

Frederick J. Wythe, Hebron, and Harald Hoette, Farmington, Conn., assignors to Emhart Corporation, Bloomfield, Conn.

Filed Apr. 25, 1968, Ser. No. 723,985
Int. Cl. C03b 5/38
U.S. Cl. 65—334 7 Claims



A fixed frame for the shears is mounted beneath the outlet of a feeder bowl, and a pair of horizontally reciprocable carriages are mounted in the frame for movement in opposite directions, and carry opposed pairs of shear blades for severing gobs of glass from a plurality of suspended molten glass columns accumulated at said feeder bowl outlet. One blade in each pair is movably mounted in its associated carriage for vertical adjustment with respect to the other blade, and a hand operated adjustment knob carries a shaft which is slidable in the frame and its inner end is engageable with the blade mounting means when the carriage is retracted for accomplishing these adjustments during operation of the shears. A drop guide is also provided below each adjustable blade in each of said pairs of blades, and said drop guide is adjustable horizontally through another hand knob and shaft located above the shear blade adjusting knob.

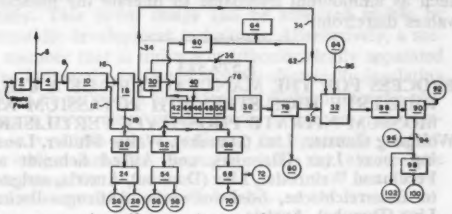
3,579,320

PROCESS FOR PRODUCING AND RECOVERING VALUABLE MATERIALS FROM MUNICIPAL WASTE

Marvin Presses, Liberty Township, Trumbull County, Ohio, assignor to General Ecological Systems, Inc., Pittsburgh, Pa.

Filed Aug. 18, 1969, Ser. No. 850,808
Int. Cl. C05f 11/08
U.S. Cl. 71—9 6 Claims

A process for producing and recovering valuable materials from a burden comprising a mixture of organic and inorganic waste materials comprising the steps of separating large refuse items from the burden and separately recovering same; opening containers of refuse present in the burden and separately recovering the containers; subjecting the burden to a magnetic separation operation and separately recovering the magnetic materials; classifying the non-magnetic materials according to size



ranges; removing discrete items of refuse such as glass, plastic, metals, paper and the like from the large size range material and separately recovering the discrete refuse items; comminuting the large and intermediate size range materials and combining the comminuted material with the small size range material to form an organic mass; composting the organic mass, preferably in a mixture with raw sewage; and recovering a sterile compost.

3,579,321

AMMONIUM PHOSPHATE FERTILIZER COMPOSITION AND METHOD

Jerry H. Stoller, Springfield, Ill., assignor to Brandt Chem. Co., Inc., Pleasant Plains, Ill.

No Drawing. Filed Mar. 9, 1970, Ser. No. 18,402
Int. Cl. C05f 11/00
U.S. Cl. 71—25 10 Claims

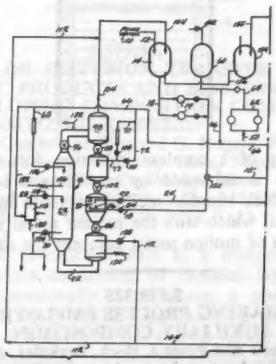
A fluid ammonium phosphate composition and method utilizing wet process phosphoric acid or spent phosphoric acid which contain metallic impurities. Lignin sulfonate is added to the acid prior to ammoniation in sufficient quantities to prevent formation of gelatinous precipitate during ammoniation.

3,579,322

RECOVERY OF PHOSPHATE FROM PHOSPHATE CONTAINING POND WATER

Irwin R. Higgins, Oak Ridge, Tenn., assignor to Chemical Separations Corporation, Oak Ridge, Tenn.

Filed Dec. 1, 1966, Ser. No. 598,418
Int. Cl. C05b 7/00
U.S. Cl. 71—34 5 Claims



A continuous process for treating a waste aqueous stream containing phosphate values to recover said phosphate values including initially removing contaminating cations from the waste aqueous stream by contacting the same with a cation exchange resin bed and then contacting the essentially contaminating cation-free aqueous

stream with an anion exchange resin bed to eliminate the phosphate values therefrom and then removing the phosphate values loaded on the anion exchange resin with a regenerating agent. In another embodiment, the waste aqueous stream by-passes the cation exchange resin and is contacted only with a weak-base anion exchange resin which is, thereafter, contacted with a regenerating agent, such as ammonium hydroxide to liberate the phosphate values therefrom.

3,579,323

PROCESS FOR THE MANUFACTURE OF A CHLORIDE-FREE HIGH-STRENGTH POTASSIUM AMMONIUM NITRATE PHOSPHATE FERTILISER

Wolfgang Gauster, Linz (Danube), Walter Muller, Leonding, near Linz (Danube), and Alfred Schmidt and Ferdinand Weinrotter, Linz (Danube), Austria, assignors to Osterreichische, Stickstoffwerke Aktiengesellschaft, Linz (Danube), Austria

No Drawing. Filed Sept. 26, 1968, Ser. No. 763,017
Int. Cl. C05b *11/06;* C05c *5/02;* C05d *1/02*
U.S. Cl. 71—35 2 Claims

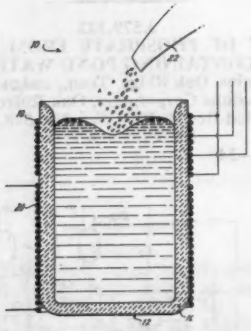
Process for the manufacture of chloride-free high-strength potassium ammonium nitrate phosphate fertilisers by reaction of potassium chloride with liquid or gaseous N_2O_4 at a temperature of at most 80° C. The reaction medium used is phosphoric acid or a mixture of phosphoric acid and nitric acid. After removal of the nitrosyl chloride formed and neutralising the resulting acid/potassium nitrate suspension with ammonia the mixture is shaped and dried.

3,579,324

METHOD FOR INDUCTION MELTING OF FINE PARTICLES

Theodore R. Kennedy, Willingboro, and Henry M. Rowan, Moorestown, N.J., assignors to Inductotherm Corporation, Rancocas, N.J.

Filed Nov. 18, 1968, Ser. No. 776,450
Int. Cl. C22d *7/00;* H05b *5/08*
U.S. Cl. 75—10 1 Claim



The ability of a coreless induction furnace to melt fine particles is enhanced by providing a lower single phase coil which supplies melting currents and an upper polyphase coil which stirs the molten metal so as to lift the outer rim of molten metal adjacent the surface.

3,579,325

STEEL-MAKING PROCESS EMPLOYING AN AUXILIARY COMPOSITION

Joseph K. Stone and Peter J. Beck, Berkeley, and Edward J. Prince, Oakland, Calif., assignors to Kaiser Industries Corporation, Oakland, Calif.

No Drawing. Filed Dec. 26, 1967, Ser. No. 693,123
Int. Cl. C21c *5/28, 5/36*
U.S. Cl. 75—51 7 Claims

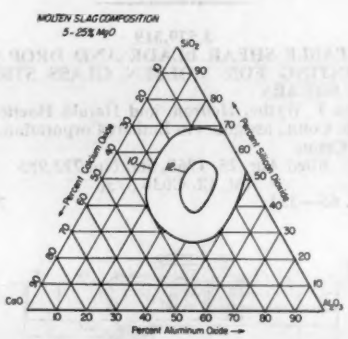
A composition for charging to a metallurgical furnace, such as an oxygen steel furnace which is a heat- and flux-producing agent consisting essentially of a granular admixture of from 5% to 95% calcium carbide and from 95% to 5% silicon carbide. Both components provide fuel to enable the use of higher amounts of scrap metal; and in one embodiment the silicon carbide and calcium carbide are admixed in a ratio to give an eventual slag of suitable lime-silica ratio. The admixture of silicon carbide and calcium carbide is advantageously admixed with a minor amount of a hydrocarbon bonding agent which is at least semi-solid at ordinary room temperatures, such as tar or pitch, and formed into compacts, e.g. pellets or briquettes. Powdered aluminum metal can also be incorporated.

3,579,326

PROCESS FOR THE PRODUCTION OF MAGNESIUM

Julian M. Avery, Greenwich, Conn.
(47 Old Orchard Road, Chestnut Hill, Mass. 02167)

Filed June 26, 1967, Ser. No. 648,856
Int. Cl. C22b *45/00*
U.S. Cl. 75—67 11 Claims



A process for the production of magnesium by reducing magnesium oxide from an oxidant containing a major proportion of magnesia with reductant containing a metallic aluminum-silicon alloy, having a ratio of silicon to aluminum of at least 0.8 to 1, at a temperature of at least 1400° C. and in the presence of a molten slag of defined composition and comprising 5–25 percent magnesium oxide, and less than 30 percent calcium oxide. The reductant and slag are preferably chosen having compositions falling within the areas shown in the figures. As a consequence, the reductant and slag are coordinated such that much of the alumina and silica of the slag are derived by the oxidation of the reductant.

3,579,327

COBALT REMOVAL FROM ZINC ELECTROLYTE SOLUTION

Tokushige Hasegawa, Narashino-shi, Kuninobu Makimoto, Aizu-Wakamatsu-shi, and Seiji Nihei and Jiro Takahira, Bandai-machi, Yama-gun, Japan, assignors to Nisso Kinzoku Kabushiki Kaisha, Tokyo-to, Japan

Filed Apr. 9, 1968, Ser. No. 719,951
Int. Cl. C22b *19/32*
U.S. Cl. 75—109 6 Claims

Zinc dust containing a small amount of antimony or antimony and lead as alloy elements is added into an electrolyte used in hydrometallurgy of zinc, in order to remove cobalt impurities from the electrolyte of zinc sulfate solution.

3,579,328

PROCESS FOR THE PRODUCTION OF FERROVANADIUM DIRECTLY FROM SLAG OBTAINED FROM VANADIUM-CONTAINING PIG IRON

Helge Aas, Svelgen, and Rolf Nordheim, Oslo, Norway, assignors to Christiania Spigerverk, Oslo, Norway

No Drawing. Filed Apr. 11, 1968, Ser. No. 720,461
Claims priority, application Norway, May 31, 1967, 168,400
Int. Cl. C22c *39/50*
U.S. Cl. 75—133.5 5 Claims

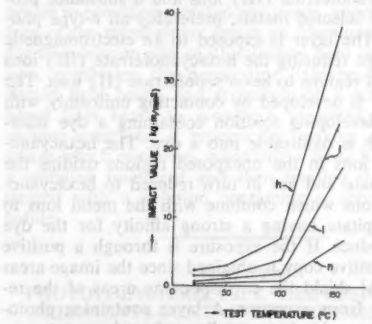
A process is provided for the production of ferrovanadium from slag obtained from vanadium-containing pig iron or other vanadium-containing material, characterized in that the reduction of the slag is carried out in two steps: (1) in the first step a reducing agent is added in such amounts that the substantial portion of the iron oxide in the slag is substantially reduced to metallic iron, whereas practically none of the vanadium oxide is reduced; whereupon after removing the metallic iron from the slag, the fluid vanadium-rich slag is subjected to a further final reduction step (2) by adding a powerful reducing agent thereto, such as Si-rich ferro-silicon in such amounts that the remaining iron oxide in the slag and the major part of the vanadium oxide therein is reduced, and whereby the reducing agent is added gradually under continuous agitation to avoid local concentrations of the reducing material and the thus-obtained ferrovanadium is removed from the slag in a conventional manner.

3,579,329

OXIDATION RESISTANT IRON-CHROMIUM-ALUMINUM ALLOYS

Satoru Mito, Yokohama-shi, Mitsuo Kawai, Tokyo, Hiroshi Yoshida, Yokohama-shi, and Kenichiro Ando, Tokyo, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed May 12, 1969, Ser. No. 823,778
Int. Cl. C22c *37/10, 39/02*
U.S. Cl. 75—124 4 Claims



Heat resistant and oxidation resistant iron-chromium-alumiunm alloys consisting of 15 to 30 percent by weight of chromium, 3 to 7 percent by weight of aluminum, 0.001 to 0.5 percent by weight of one or more of beryllium, magnesium and barium, remainder iron and incidental impurities.

3,579,330

IMAGE-FORMING PROCESS UTILIZING CONTACT ELECTRIFICATION

Robert G. Cunningham, Pittsford, and Harrison P. Hood III, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed May 20, 1968, Ser. No. 730,624
Int. Cl. G03g *13/22*
U.S. Cl. 96—1 10 Claims

Electrostatic charge images are produced on a member having an electrically insulating surface when it is intimately contacted with a portion of a second member including originals to be copied that is, at least in part, triboelectrically separated or remote from the insulating surface. After the second member and insulator are separated, a latent electrostatic charge image is present upon the electrically insulating surface in a pattern corresponding to the triboelectrically separated or remote areas of the original that are intimately contacted with the insulating member. This latent image can be rendered visible by electrostatic development techniques. Alternatively, a second member that is uniformly triboelectrically separated can be intimately contacted with an electrically insulating member or surface in an imagewise fashion, thereby producing a latent electrostatic charge image on such insulator in a pattern corresponding to the imagewise contact. This image can also be made visible by electrostatic development.

3,579,331

ELECTROPHOTOGRAPHIC MATERIALS CONTAINING CYANINE DYE SENSITIZERS

John D. Mee and Donald W. Heseltine, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Apr. 8, 1968, Ser. No. 719,690
Int. Cl. G03g *5/02, 5/06*
U.S. Cl. 96—1.6 26 Claims

Organic photoconductors are spectrally sensitized with a cyanine dye containing a carbazole nucleus.

3,579,332

SINGLE-CRYSTAL ZINC OXIDE AND AN ELECTROPHOTOGRAPHIC PLATE MADE THEREFROM

Richard Williams, Princeton, N.J., assignor to RCA Corporation

Filed May 27, 1968, Ser. No. 732,326
Int. Cl. G03g *5/00*
U.S. Cl. 96—1.8 6 Claims

An improved electrophotographic plate has a photoconductive layer of one or more relatively large wafers of single-crystal, n-type zinc oxide. Each wafer is fixed to, and in electrical contact with, an electrically conductive backing. The novel method of charging the electrophotographic plate comprises (1) wetting a major surface of the zinc oxide layer with a solution of an ionizable salt in a relatively volatile solvent while biasing the solution with a negative voltage with respect to the backing, and (2) allowing the solvent to evaporate, whereby to leave an electrostatic charge on the zinc oxide surface.

3,579,333

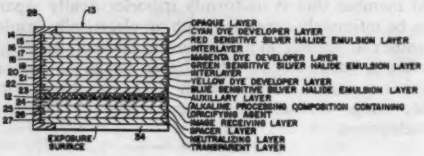
MULTICOLOR DIFFUSION TRANSFER PHOTOGRAPHIC PRODUCTS AND PROCESSES WITH A DEVELOPING COMPOSITION COMPRISING A DESENSITIZING AGENT

Edwin Land, Cambridge, Howard G. Rogers, Weston, and Richard W. Young, Wellesley Hills, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed July 18, 1968, Ser. No. 745,749
Int. Cl. G03c *7/00, 5/54, 5/32*
U.S. Cl. 96—3 18 Claims

The present invention relates to a composite photosensitive structure containing, as essential layers, in sequence, a dimensionally stable layer; a photosensitive direct negative silver halide emulsion layer having associated therewith a dye which is a silver halide developing agent and is processing composition soluble and diffusible as a function of the photosensitive silver halide emulsion layer's exposure and a silver halide desensitizing agent adapted to effect, subsequent to photoexposure, desensitization of the photosensitive silver halide emulsion layer without substantial detriment to the latent image carried by the emulsion layer; a polymeric layer dyeable by dye

diffusing thereto; a dimensionally stable layer transparent to actinic radiation; and to specified photographic diffu-



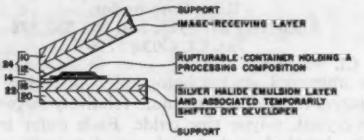
sion transfer processes employing such composite photosensitive structure.

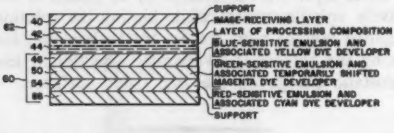
3,579,334

DYE DEVELOPERS WHICH ARE NON-REVERSIBLY SPECTRALLY SHIFTED BY ALKALINE HYDROLYSIS IN COLOR DIFFUSION TRANSFER PROCESSES AND ELEMENTS

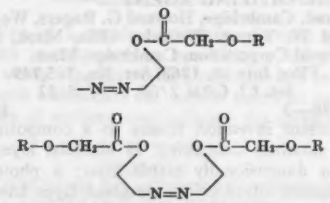
Ronald F. W. Cieciuch, Boston, and Myron S. Simon, Newton Center, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 30, 1968, Ser. No. 756,481
Int. Cl. G03c *5/54, 7/00*
U.S. Cl. 96—29 **13 Claims**

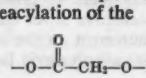

SUPPORT
IMAGE-RECEIVING LAYER
RUPTURABLE CONTAINER HOLDING A PROCESSING COMPOSITION
SILVER HALIDE EMULSION LAYER AND ASSOCIATED TEMPORARILY SHIFTED DYE DEVELOPER
SUPPORT


SUPPORT
IMAGE-RECEIVING LAYER
LAYER OF PROCESSING COMPOSITION
BLUE-SENSITIVE EMULSION AND ASSOCIATED YELLOW DYE DEVELOPER
GREEN-SENSITIVE EMULSION AND ASSOCIATED TEMPORARILY SHIFTED MAGENTA DYE DEVELOPER
RED-SENSITIVE EMULSION AND ASSOCIATED CYAN DYE DEVELOPER
SUPPORT

Transfer images in color are formed by exposing a photosensitive element containing a silver halide emulsion and a mono or disazo dye which contains not less than one or more than two groups selected from the group represented by the formulae.



wherein R is a lower alkyl group, said dyes also containing not less than one nor more than two dihydroxyphenyl silver halide developing radicals; permeating the photosensitive element with an aqueous alkaline processing composition, and deacylation of the



groups by hydrolysis to provide hydroxyl groups, thereby providing a non-reversible bathochromic shift of the spectral absorption characteristics of dye; immobilizing the dye as a result of the development of the exposed areas of the emulsion; and transferring, by diffusion, at least a portion of the imagewise distribution of dyes to a superposed image receiving layer to provide a positive dye image therein.

3,579,335

METHOD FOR MANUFACTURING COLOR TELEVISION RECEIVER TUBES

Michio Tamura, Kanagawa-ken, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation-in-part of application Ser. No. 540,671, Apr. 6, 1966, now Patent No. 3,437,482. This application Mar. 31, 1967, Ser. No. 627,521
Claims priority, application Japan, Apr. 2, 1966, 41/20,606
Int. Cl. G03c *5/00*
U.S. Cl. 96—36.1 **10 Claims**

A method for manufacturing color television screens for cathode ray tubes comprising the steps of printing a shadow image of a post-deflection-focusing grid on a plate, positioning the optical mask relative to a face plate in accordance with a spurious pattern resulting from light interference, and forming color phosphors on the face plate.

3,579,336

PHOTOCHEMICAL RECORDING PROCESS

Eric Maria Brinckman, Mortsel, Walter August Van den Heuvel, Berchem, and Johan Eugeen Vanhalst, Wilrijk, Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium

No Drawing. Filed Dec. 15, 1967, Ser. No. 690,799
Claims priority, application Great Britain, Dec. 15, 1966, 56,296/66, 56,297/66
Int. Cl. G03c *1/56, 1/58, 1/64*
U.S. Cl. 96—49 **10 Claims**

Process of reproduction using a recording layer containing hexacyanoferrate (III) ions and a substance providing ions of selected metals, preferably an n-type photoconductor. The layer is exposed to an electromagnetic radiation image reducing the hexacyanoferrate (III) ions in the exposed regions to hexacyanoferrate (II) ions. The exposed layer is developed by contacting uniformly with an aqueous developing solution containing a dye intermediate which is oxidizable into a dye. The hexacyanoferrate (III) ions in the unexposed regions oxidize the dye intermediate and are in turn reduced to hexacyanoferrate (II) ions which combine with the metal ions to form a precipitate having a strong affinity for the dye oxidation product. If the exposure is through a positive original, a positive copy is obtained since the image areas of the original shield the corresponding areas of the recording layer from exposure. A layer containing photoconductive zinc oxide is especially preferred.

3,579,337

PHOTOCHEMICAL RECORDING METHOD BY MEANS OF HEXACYANOFERRATE(III)

Eric Maria Brinckman, Mortsel, Johan Eugeen Vanhalst, Wilrijk, and Walter August Van den Heuvel, Berchem, Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium

No Drawing. Filed Dec. 15, 1967, Ser. No. 690,800
Claims priority, application Great Britain, Dec. 15, 1966, 56,294/66, 56,295/66
Int. Cl. G03c *1/52, 1/58, 1/64*
U.S. Cl. 96—49 **12 Claims**

Process of reproduction using a recording layer containing hexacyanoferrate(III) ions and a substance providing ions of selected metals. The layer is exposed to an electromagnetic radiation image reducing the hexacyanoferrate(III) ions to hexacyanoferrate(II) ions which react

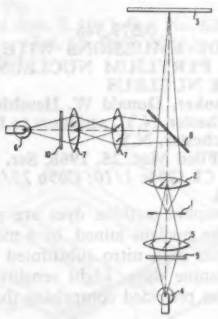
with the metal ions to form a precipitate having a strong attraction for a cationic dye. The exposed layer is developed by contracting uniformly with a developing solution containing the cationic dye.

3,579,338

PROCESS FOR MAKING METAL-GLOSSY IMAGES AND PROJECTION USING THE SAME

Shingo Ooue and Hiroyuki Ueda, Saitama, and Yoshihide Hayakawa, Ashigara-Kamigun, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 14, 1968, Ser. No. 705,456
Claims priority, application Japan, Feb. 14, 1967, 42/9,421
Int. Cl. G03c *5/26, 5/24;* **G03b** *27/54, 27/76*
U.S. Cl. 96—50 **15 Claims**



A projection process which comprises subjecting a silver halide image to a sulfiding treatment, treating the image thus treated with a solution containing a solvent for silver halide to provide a metal-glossy image, applying to the surface of the metal-glossy image an illuminating light beam for transmission and an illuminating light beam for reflection, combining the penetrating light beam and the reflected light beam, and projecting on a screen the combined light beam to provide a projected image having various contrasts. A process for making a metal-glossy image which comprises subjecting a silver halide image to a sulfiding treatment and then treating the image thus treated with a solution containing a solvent for silver halide.

3,579,339

PHOTOPOLYMERIZABLE DISPERSIONS AND ELEMENTS CONTAINING NONMIGRATORY PHOTOREDUCIBLE DYES

Catherine Teh-lin Chang, New Brunswick, and Peter Walker, Red Bank, N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed May 23, 1967, Ser. No. 640,496
Int. Cl. G03c *1/76, 3/00, 1/68*
U.S. Cl. 96—74 **12 Claims**

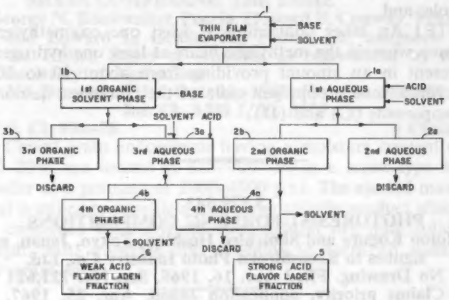
A photopolymerizable dispersion and layers comprising a continuous phase with an oragnic macromolecular polymer dispersion medium (e.g., gelatin) and a dispersed phase including an addition polymerizable ethylenically unsaturated compound (e.g., a monomer such as pentaerythritol triacrylate, and at least one of the ingredients of a color image-yielding composition (e.g., a photographic color former) in reactive association with a photoinitiator mixture comprising (a) a nonmigratory, photoreducible dye, e.g., Methylene Blue having the four methyl radicals replaced by butyl radicals, and (b) a free-radical producing agent, e.g., N-phenylglycine.

3,579,340

ISOLATING ACIDIC MATERIALS FROM A THIN FILM EVAPORATE

Rudolf G. K. Strobel, Colerain Township, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 8, 1969, Ser. No. 822,943
Int. Cl. A23f *1/08, 1/04*
U.S. Cl. 99—71 **17 Claims**



Coffee flavor present in a thin film evaporate consists of both beneficial and detrimental flavor constituents. Disclosed is a process of separating beneficial constituents frome detrimental constitutents by an acid/base liquid/liquid extraction process. The thin film evaporate is separated into acid fractions, a basic fraction and a neutral fraction. The basic and neutral fractions are detrimental and are discarded. The acidic fractions are beneficial and are added back to dry soluble coffee to provide improved flavor.

3,579,341

PULPY TEXTURED FOOD SYSTEMS CONTAINING INHIBITED STARCHES

Paolo C. Trubiano, Somerville, and Nicholas G. Marotta, Green Brook, N.J., assignors to National Starch and Chemical Corporation, New York, N.Y.

No Drawing. Filed May 7, 1969, Ser. No. 822,722
Int. Cl. A23l *1/00, 1/10, 1/40*
U.S. Cl. 99—83 **5 Claims**

A method for the preparation of starch containing food products exhibiting a grainy, pulpy texture, as well as the food products thus prepared, said method comprising the step of admixing the non-starch ingredients of said food product with an amylose-containing starch product which has been inhibited by reaction with a crosslinking agent, then precooked, gelatinized, and pulverized to within a certain particle size range, and thereafter heating the resulting mixture at a temperature of at least about 160° F. so as to effect the swelling of the starch particles therein.

3,579,342

LEUCO TRIARYLMETHANE/HEXAARYLBIIMIDAZOLE COLOR FORMING SYSTEM CONTAINING A DEACTIVATOR

Peter S. Strilko, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed June 27, 1968, Ser. No. 740,476
Int. Cl. G03c *1/72*
U.S. Cl. 96—90 **14 Claims**

A photoimagable and photodeactivatable composition of

(A) A salt of a leuco triarylmethane and a salt-forming acid;

(B) A hexaarylbiimidazole which absorbs principally in the ultraviolet region and is a photooxidant for the salt

of the leuco triarylmethane present in an amount of from about 1 to 2 moles per mole of said salt of the leuco triarylmethane;

(C) 1,6-pyrenequinone or 1,8-pyrenequinone or both, present in an amount of from about .04 to .4 mole per mole of hexaarylbiimidazole;

(D) A visible light-absorbing carbonyl compound selected from 9,10-phenanthrenequinone, perinaphthenone, or 4-methoxy-1,2-naphthoquinone; present in an amount of from about .05 to 2 moles per mole of hexaarylbiimidazole; and

(E) An ether containing at least one oxymethylene group wherein the methylene bears at least one hydrogen; present in an amount providing from about 50 to 500 oxymethylene groups per mole of the combined quinone components (C) and (D).

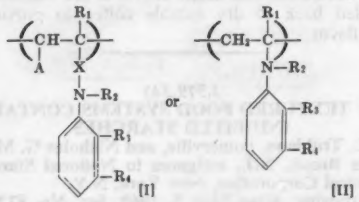
3,579,343

PHOTORESIST-FORMING COMPOSITIONS

Motoo Kogure and Shoichiro Hoshino, Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd.

No Drawing. Filed Apr. 16, 1968, Ser. No. 721,621
Claims priority, application Japan, Apr. 25, 1967, 42/25,988
Int. Cl. G03c *1/70, 1/72*
U.S. Cl. 96—90R **2 Claims**

A photoresist-forming composition comprising a photo activator having a polychlorinated or polybrominated methyl group capable of forming a free radical by the action of light and a homopolymer or a co-polymer with other vinyl monomer, of a monomer represented by the general formula



wherein A is a hydrogen atom, a carboxylic acid or carboxylic acid amide; X is —$COOCH_2CH_2$—,

—$CONHCH_2CH_2$—

—$COSCH_2CH_2$, —CONH—, —CH_2—, —ϕSO_2NH—, —$\phi SO_2O\phi$—, —CONHϕ—; R_1 is a hydrogen atom or a lower alkyl group: R_2 is a hydrogen atom, a lower alkyl group or a substituted or unsubstituted phenyl group; and R_3 and R_4 are individually a hydrogen atom or a lower alkyl group, provided that in the case of the Formula II, R_2 and R_3 may form a heterocyclic ring together with nitrogen and the benzene ring, and R_3 and R_4 may form a naphthalene ring together with the benzene ring.

3,579,344

NOVEL DYES AND DIRECT POSITIVE PHOTOGRAPHIC EMULSIONS

Frank G. Webster, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Sept. 8, 1967, Ser. No. 666,512
Int. Cl. G03c *1/08*
U.S. Cl. 96—139 **18 Claims**

Novel merocyanine and oxonol dyes are provided which feature a 3-arylamino or a 3-lower fatty acid amido substituted 2-pyrazolin-5-one nucleus. Merocyanine dye salts of the invention sensitize direct positive photographic silver halide emulsions.

3,579,345

DIRECT POSITIVE EMULSIONS SENSITIZED WITH PYRYLIUM AND/OR THIAPYRLIUM SALTS

Jean E. Jones, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 609,762, Jan. 17, 1967. This application Oct. 2, 1967, Ser. No. 671,971
Int. Cl. G03c *1/08, 1/28*
U.S. Cl. 96—102 **19 Claims**

Pyrylium, thiapyrylium or selenapyrylium salts are incorporated in direct positive photographic silver halide emulsions.

3,579,346

SILVER HALIDE EMULSIONS WITH DYES CONTAINING A PYRYLIUM NUCLEUS JOINED TO A PYRAZOLE NUCLEUS

Leslie G. S. Brooker, Donald W. Heseltine, and Daniel S. Daniel, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Mar. 25, 1968, Ser. No. 715,530
Int. Cl. G03c *1/10;* **C09b** *23/10*
U.S. Cl. 96—106 **32 Claims**

Novel photographic methine dyes are provided which feature a pyrylium nucleus joined, by a methine chain, to a pyrazole nucleus or a nitro substituted nucleus of the type used in cyanine dyes. Light sensitive silver halide emulsions are also provided comprising the novel dyes of this invention.

3,579,347

SILVER HALIDE EMULSION CONTAINING WATER-SOLUBLE POLYMER

Henry Walter Wood, Ilford, England, assignor to Ilford Limited, Ilford, Essex, England

No Drawing. Filed June 10, 1969, Ser. No. 832,021
Claims priority, application Great Britain, June 14, 1968, 28,394/68
Int. Cl. G03c *1/28, 1/72*
U.S. Cl. 96—114 **6 Claims**

This application describes photographic material which comprises a gelatino silver halide emulsion layer the photographic material being characterised in that there is present in the said emulsion layer or in a layer in operative contact with the said emulsion layer a water-soluble homopolymer of a compound of the general formula:

$$(CH_2{=}CH{-}CH_2)_2NR_1R_2{}^+X^-$$

where R_1 and R_2 are each hydrogen atoms or alkyl groups and X is an anion, or a water-soluble copolymer thereof with minor amounts of other ethylenically unsaturated monomers.

3,579,348

DIRECT-PRINT SILVER HALIDE EMULSIONS

Delbert Dale Fix and Richard Warren Karlson, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Oct. 21, 1966, Ser. No. 588,342
Int. Cl. G03c *1/08, 1/10, 1/28*
U.S. Cl. 96—126 **14 Claims**

Direct-print silver halide emulsions comprising the combination of a urazole halogen acceptor and a merocyanine dye having carboxy-containing substituents thereon provide improved photographic systems having better image properties such as, for example, improved image discrimination upon storage.

3,579,349

PREPARATION OF CHOCOLATE EXTRACT

Abraham R. Mishkin, Richard D. Martin, and Joseph L. Ohler, Marysville, Ohio, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

No Drawing. Filed Aug. 19, 1968, Ser. No. 753,779
Int. Cl. A23g *1/00*
U.S. Cl. 99—23 7 Claims

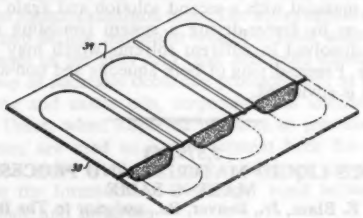
A chocolate extract is prepared by steam-stripping a mixture of water and cocoa liquor to remove and recover aromatic constituents, heating the stripped mixture, separating the aqueous phase containing the water-soluble constituents and adding the recovered aromatics.

3,579,350

BEVERAGE TAPE

Lloyd K. Rudd, Berwyn, and George R. Schollhamer, Philadelphia, Pa., assignors to Rudd-Melikian, Inc., Warminster, Pa.

Filed Apr. 7, 1967, Ser. No. 629,138
Int. Cl. B65b *29/02*
U.S. Cl. 99—77.1 4 Claims



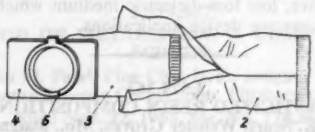
Beverage tape consisting of a pair of water permeable strips encapsulating within cavities pods of beverage material. The cavities are interconnected by flat web portions and are located within one of the strips so that substantially all of the beverage material is positioned on one side of the web. The pods are of elongated plan shape with its major axis extending transversely to the length of the strips. The pods act to self-position the tape within a brewing machine.

3,579,351

COFFEE POWDER PACKAGE

Hans Wege, Hanau-Hohe Tanne, and Eric Gast, Frankfurt, Germany, assignors to Firm Wilhelm Kuhn, Hanau, Germany

Filed Jan. 17, 1969, Ser. No. 791,980
Claims priority, application Germany, Aug. 5, 1968, K 61,973
Int. Cl. B65d *65/00*
U.S. Cl. 99—77.1 1 Claim



A filter paper bag has an open top end and is partly filled with coffee powder. A flanged plate is secured to said open top end and laterally outwardly protrudes therefrom and is formed with an aperture which communicates with the interior of said bag. A cover closes the aperture. The filter paper bag is entirely enclosed by an aroma-tight wrapper bag.

3,579,352

EXTRUDER-COOKED CEREAL ENDOSPERM PARTICLES AND INSTANT BEVERAGE MIXES COMPRISING THE SAME

George N. Bookwalter, Peoria, Howard F. Conway, Pekin, and Edward L. Griffin, Jr., Peoria, Ill., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Oct. 31, 1968, Ser. No. 772,380
Int. Cl. A23l *1/00, 1/10*
U.S. Cl. 99—78 4 Claims

Cereal grain endosperms having a moisture content of 10–20% are heated at 325–400° F. in a screw-type extruder at a pressure of 2000–4000 p.s.i. The ejected material is milled to provide a cold water soluble product which is combined with soybean flour, nonfat dry milk solids, sugar, salt, minerals and vitamins to form an instant beverage mix.

3,579,353

FOOD PRODUCTS CONTAINING ALKYL-SUBSTITUTED PYRAZINES

Gunther M. Nakel and Brinton Marlo Dirks, Springfield Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed Oct. 23, 1967, Ser. No. 677,030
Int. Cl. A23l *1/18, 1/22*
U.S. Cl. 99—81 4 Claims

Food products are made more flavorful by adding 0.15–10,000 p.p.m. of alkyl-substituted pyrazines, especially those having molecular weight less than 140.

3,579,354

PREPARATION OF AN ELASTIC CHEESE PRODUCT

Robert L. Kasik and Anthony J. Luksas, Chicago, Ill., assignors to Beatrice Foods Co., Chicago, Ill.

No Drawing. Filed Aug. 1, 1968, Ser. No. 749,309
Int. Cl. A23c *19/02*
U.S. Cl. 99—116 12 Claims

An elastic cheese product is made by inoculating sodium caseinate containing butterfat with lactic acid organisms in aqueous medium, then inoculating with a micrococcus, fermenting aerobically until the system becomes elastic and plastic, then acidifying the pH 4.5 and drying.

A bland product can be prepared by growing trained *Streptococcus lactis* and/or micrococci on aqueous sodium caseinate, acidifying, removing the liquid, resuspending with aid of alkali to pH 6–7 and drying.

3,579,355

MULTILAYERED GELATIN CONTAINING DESSERTS

Clement R. Wyss, Scarsdale, Robert Cassanelli, Yorktown Heights, and Joseph Russo, Irvington, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 783,738, Dec. 13, 1968. This application Oct. 22, 1969, Ser. No. 868,578
Int. Cl. A23l *1/04*
U.S. Cl. 99—130 8 Claims

Dry composition comprising a combination of gelatin and fat, sugar and an emulsifier for the fat which upon successive whipping with water at various temperatures produces a 2 or 3 layered multitextured gelatin dessert when the product cools.

3,579,356

TITANIUM DIOXIDE WHITENED COMESTIBLE COMPOSITIONS

Donald E. Miller, Oak Park, and Cecelia R. Gilmore, Oak Lawn, Ill., assignors to SCM Corporation, Cleveland, Ohio

No Drawing. Filed Apr. 24, 1968, Ser. No. 723,920
Int. Cl. A23l *1/27*
U.S. Cl. 99—148 8 Claims

Compositions comprising comestible base and a blend of TiO_2, and an edible organic nitrogen-containing, sulfur containing, or sulfur and nitrogen containing edible organic compound are described.

The compositions are advantageous in that they make possible comestible products of enhanced whiteness or lightness of color. The compositions are further advantageous in that TiO_2 which is a relatively dense material does not settle but remains dispersed in the compositions.

3,579,357

FOODSTUFFS CONTAINING AN ANTIOXIDANT

Hirotoshi Samejima, Machida-shi, Tokyo-to, Kiyoshi Nakayama, Sagamihara-shi, and Yuji Nagano, Machida-shi, Tokyo-to, Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Jan. 15, 1968, Ser. No. 697,771
Claims priority, application Japan, Jan. 16, 1967, 42/2,731
Int. Cl. A23b *7/00*; A23l *3/34*
U.S. Cl. 99—154 3 Claims

There are provided compositions comprising at least one substance susceptible to oxidation by atmospheric air and a compound of the formula

$$R—S—(CH_2)_n—NH_2$$

wherein R represents a hydrogen atom or a lower alkyl group and *n* is 2 or 3. The oxidation of the substance is greatly inhibited.

3,579,358

METHOD OF PREPARING AN EDIBLE TUBULAR COLLAGEN CASING

Albert Courts, Solihull, England, assignor to Lever Brothers Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 810,917, Mar. 24, 1969, which is a continuation of application Ser. No. 463,021, June 10, 1965. This application Nov. 26, 1969, Ser. No. 880,436
Int. Cl. A22c *13/00*
U.S. Cl. 99—176 31 Claims

Collagen is chemically modified by treatment with a strong alkali in the presence of an alkali metal salt capable of preventing swelling of the collagen. The collagen is then swollen and formed into a dough and is extruded into a precipitating bath to form a tubular casing, particularly a sausage casing.

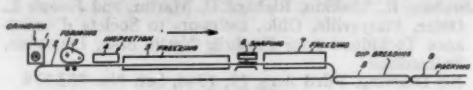
3,579,359

METHOD FOR PRODUCTION OF DEEP FROZEN FISH PRODUCTS

Eiler Schjolberg, Reinslettveien 32, Bodo, Norway

Filed Mar. 26, 1968, Ser. No. 716,055
Claims priority, application Norway, Apr. 5, 1967, 167,593
Int. Cl. A23b *3/00, 3/06*
U.S. Cl. 99—195 3 Claims

The invention relates to a method for production of foodstuffs in the form of deep frozen, shaped products, for example, the so-called fish sticks, grill fingers, breaded portions and similar substantially processed products, produced from fish or other raw materials, in which the raw material is ground to a mass consisting of grain size particles, formed into a band-like product and frozen to a consistency and temperature suitable for portioning, whereafter portioning into shaped portions is carried out



and the said products are further frozen to the desired keeping temperature.

3,579,360

LYOPHILISING A CARBON DIOXIDE SOLUTION

Louis René Rey, St.-Legier, Switzerland, Monick Dousset, Paris, France, and Françoise Chauffard, Vevey, Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A.

No Drawing. Filed July 6, 1967, Ser. No. 651,378
Claims priority, application Switzerland, July 8, 1966, 10,054
Int. Cl. A23f *1/06*; F26b *5/06*
U.S. Cl. 99—199 5 Claims

Porous composite materials, consisting of a continuous phase and a disperse phase in intimate association with the continuous phase may be obtained by the application of freeze-drying techniques. The materials may be prepared either by freeze-drying a first solution, impregnating the dry material with a second solution and again freeze-drying, or by freeze-drying a system consisting of two solutes dissolved in different solvents which may be immiscible. Freeze-drying of both aqueous and non-aqueous systems is envisaged.

3,579,361

VISCOUS LIQUID MATERIAL AND PROCESS FOR MAKING SAME

Joseph E. Blaze, Jr., Beaver, Pa., assignor to The Babcock & Wilcox Company, New York, N.Y.

No Drawing. Filed Apr. 22, 1969, Ser. No. 818,446
Int. Cl. C09d *5/08*
U.S. Cl. 106—14 2 Claims

A viscous liquid material prepared by adding acetic acid to an aqueous solution containing aluminum chloride and a solidification inhibitor acid, and then concentrating the resultant solution at a temperature below its boiling point until it attains a selected viscosity within the range 2 to 20 poises. The inhibitor acid can be either boric acid, phosphoric acid or a mixture of both these acids. Colloidal silica can be added to the solution before final concentration to make a product containing dispersed silica.

3,579,362

DIELECTRIC $3NiO \cdot X_2O_3 \cdot 6TiO_2$ COMPOSITIONS

Russell G. West, Alexandria, Va. (% Trans-Tech, Inc., 12 Meem Ave., Gaithersburg, Md. 20760)

No Drawing. Filed Oct. 20, 1969, Ser. No. 867,910
Int. Cl. C04b *33/00*
U.S. Cl. 106—39 7 Claims

The ceramic dielectric composition of about 30 mole percent NiO, about 10 mole percent of Al_2O_3, Fe_2O_3 or mixtures thereof, and about 60 mole percent TiO_2 is disclosed. The composition is a high dielectric constant value, stable, passive, low loss dielectric medium which may be used in microwave device applications.

3,579,363

PLASTICIZED RESIN COMPOSITIONS

James K. Sears, Webster Groves, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Nov. 19, 1968, Ser. No. 777,165
Int. Cl. C08b *27/52*
U.S. Cl. 106—176 23 Claims

This invention relates to the use of certain phthalimidoacetates as plasticizers for thermoplastic resins.

3,579,364

PLASTICIZED RESIN COMPOSITIONS

James K. Sears, Webster Groves, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Nov. 21, 1968, Ser. No. 777,913
Int. Cl. C08b 27/52
U.S. Cl. 106—176 21 Claims

This invention relates to the use of certain bisphthalimidoacetates as plasticizers for thermoplastic resins.

3,579,365

COMPOSITIONS FOR AND METHODS OF IMPROVING ADHESION OF PLATED METAL ON PLASTIC SUBSTRATES

John J. Grunwald, New Haven, and Eugene D. D'Ottavio, Thomaston, Conn., assignors to MacDermid Incorporated, Waterbury, Conn.

No Drawing. Filed June 14, 1967, Ser. No. 645,901
Int. Cl. C08h 9/00; B01j 13/00
U.S. Cl. 106—265 8 Claims

A method of and composition for promoting adhesion between plated metal and a plastic substrate, in which the active agent is provided in finely divided dispersed or colloidal aqueous emulsion form. The active agents are any of a group of low molecular weight organic unsaturated compounds of the fatty acid type, and more especially of the group of naturally occurring products such as linseed, tall, tung and castor oils, turpentine and similar wood rosins. These, when dispersed in water to provide stable emulsions, are used as a pretreatment bath for plastic substrates, prior to plating of the substrate, in order to promote the formation of a stronger bond between the metal plate and substrate.

3,579,366

GRANULATED ADDITIVE, METHOD OF MAKING THE SAME, AND CEMENTITIOUS GROUT AND CONCRETE COMPOSITIONS CONTAINING THE SAME

Solomon J. Rehmar, East Cleveland, Ohio, assignor to Intrusion-Prepakt, Cleveland, Ohio

No Drawing. Filed July 12, 1968, Ser. No. 744,303
Int. Cl. C04b 21/02, 31/40
U.S. Cl. 106—314 6 Claims

As an additive for cementitious grout and concrete, a porous granule characterized by a skeletal structure and a network of interstitial voids formed by in situ gas liberation, the skeletal structure consisting essentially of a dispersion of finely divided, substantially oxide free aluminum particles in a matrix formed of a powdered inorganic extender and a water soluble binder which is inert with respect to the aluminum particles.

3,579,367

METHOD OF METALLIZING A LUMINESCENT SCREEN

Himanshu M. Patel, Pine City, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 22, 1968, Ser. No. 778,260
Int. Cl. H01j 31/20
U.S. Cl. 117—33.5 3 Claims

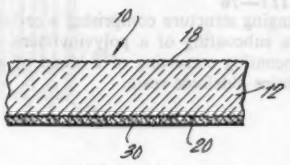
This invention relates to luminescent screens and to the application of a metallic backing layer thereon. More particularly, this invention describes a method of depositing a double coating of an organic heat removable material over the phosphor in the luminescent screen for the purpose of providing a smooth substrate upon which the metallic backing layer may be deposited.

3,579,368

SIMULATED SLATE AND METHOD FOR MAKING THE SAME

Eugene Bleiweiss, Maywood, N.J., assignor to Metaframe Corporation

Filed July 1, 1968, Ser. No. 741,487
Int. Cl. C03c 17/00
U.S. Cl. 117—54 12 Claims



Simulated slate, particularly suitable for use as an aquarium bottom, made by subjecting both sides of a sheet of glass to treatment which will render said sides in a nonsmooth or discontinuous surface, and thence applying an opaque coating to one of the discontinuous surfaces thereof.

3,579,369

WOOD MEMBERS IMPREGNATED WITH SYNTHETIC ORGANIC RESINS AND METHOD OF PRODUCING SUCH IMPREGNATED MEMBERS

Newton C. Foster, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

No Drawing. Filed June 26, 1968, Ser. No. 740,098
Int. Cl. B44d 1/28; B27k 3/36
U.S. Cl. 117—57 9 Claims

A method of making a synthetic organic resin impregnated wood member wherein the wood is pretreated with an activator, such as dimethyl aniline, in the vapor phase. A synthetic organic liquid resinous composition containing, for example, styrene and an unsaturated polyester catalyzed with benzoyl peroxide is then impregnated into the wood at about room temperature causing the resin to polymerize within the wood.

3,579,370

COMPOSITE LAYERED TETRAHALOETHYLENE STRUCTURE

John Oliver Punderson and Miguel Jacinto Roura, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of abandoned application Ser. No. 687,691, Dec. 4, 1967. This application Oct. 1, 1969, Ser. No. 862,829
Int. Cl. B32b 27/08
U.S. Cl. 117—72 13 Claims

A coating is provided which is self-adherent to a surface of tetrahaloethylene polymer, e.g., polytetrafluoroethylene, to make the polymer surface either more print-

able or to serve as an adhesive for a coating, e.g., polyvinylidene fluoride, which protects the polymer surface. In one embodiment, the coating comprises a blend of 10 to 90 percent by weight of a copolymer of tetrafluorethylene hexafluoropropylene and the remainder, to total 100 percent, of polyvinylidene fluoride.

3,579,371
BARRIER STRUCTURE FOR PACKAGING PURPOSES

Joseph A. Dooley, Cedar Grove, and Michael J. Gnozzio, Lincoln Park, N.J., assignors to Inmount Corporation

No Drawing. Filed May 22, 1968, Ser. No. 731,319
Int. Cl. B32b *29/06, 23/08;* B44d *1/14*
U.S. Cl. 117—76 3 Claims

A packaging structure comprising a cellulosic substrate carrying a subcoating of a polyvinylidene chloride resin and a topcoating consisting of a blend of an alkyd resin and an amine-aldehyde resin.

3,579,372
DEPOSITION OF MICROPOROUS FILM EMPLOYING DIELECTRIC HEATING

Lawrence W. Healy, Glen Rock, N.J., assignor to Genset Corporation, Newark, N.J.

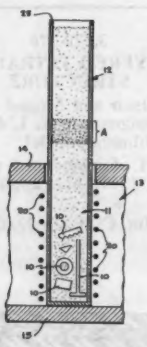
Filed Dec. 4, 1968, Ser. No. 780,987
Int. Cl. B44d *1/50, 1/092*
U.S. Cl. 117—93.1 6 Claims

Describes procedure for deposition of microporous grain layer in and on a substrate for the production of leather replacement products in which a substrate which is coated with a solution of a polymer and wetted with water is exposed to dielectric heating to vaporize the water. The vapors mix with the organic solution and effect deposition of the polymer.

3,579,373
CARBIDING

Vernon J. Pingel, 812 W. Grove St., Arlington Heights, Ill. 60005

Filed Oct. 18, 1968, Ser. No. 768,836
Int. Cl. C23c *11/08*
U.S. Cl. 117—106 4 Claims



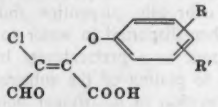
A method of applying a carbide coating to a surface of an article having 0.5% or more carbon which includes imbedding the article in a packed bed which has an upper portion at a lower temperature and in communication with the atmosphere, the condensible volatiles moving from the high temperature lower portion condense in the upper portion and are prevented from being moved into the atmosphere. The ingredients of the pack include an antifusing agent, a metal source component, halide of the metal source component, and barium chloride.

3,579,374
SHEET SUPPORTED ARTICLES COATED WITH HEAT-ACTIVABLE TANNING AGENTS AND IMPROVED METHODS OF HARDENING SAID ARTICLES AND RELATED COMPOSITIONS

René Jean Dennilauler, Maurice Edgar Pfaff, and Pierre Amédée Roman, Vincennes, France, assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed June 26, 1967, Ser. No. 649,435
Claims priority, application France, June 28, 1966, 67,164
Int. Cl. C09d *3/04;* C08h *17/62*
U.S. Cl. 117—164 16 Claims

Tanning (hardening) agents in a colloid layer of gelatin or the like are inactive at ordinary temperatures but are activated at temperatures above 70° C. to rapidly tan the colloid in which they are incorporated. Suggested uses are in thermography and photography. Specific examples describe various gelatin layers containing the heat-activated hardeners. The class of useful tanning agents is described by the formula

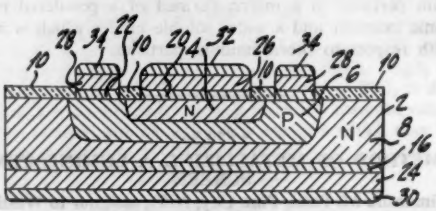


wherein the substituents R and R′ are selected from hydrogen and halogen atoms and alkyl, carboxyl, alkoxy, formyl, tertiary amino and sulfo radicals. Some specific new compounds of this class are described.

3,579,375
METHOD OF MAKING OHMIC CONTACT TO SEMICONDUCTOR DEVICES

Edmund Wonilowicz, Englishtown, and Henry F. Machnacz, Somerville, N.J., assignors to RCA Corporation

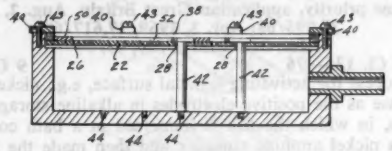
Filed Oct. 18, 1968, Ser. No. 768,719
Int. Cl. B44d *1/14*
U.S. Cl. 117—212 4 Claims



A method of making ohmic contacts to a semiconductor device wherein aluminum is deposited on at least one of several contact areas on the semiconductor body, nickel is deposited electrolessly simultaneously on the aluminum layer and on a contact area not covered with aluminum, the nickel layer being built up in a series of

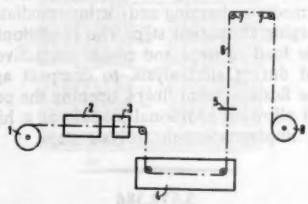
separate depositions, the nickel is sintered after each deposition and solder is finally deposited on all the nickel surfaces.

3,579,376
METHOD OF FORMING A RESIST PATTERN ON A CIRCUIT BOARD OR THE LIKE
George E. Vincent, Jr., Bethel, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed July 23, 1968, Ser. No. 746,951
Int. Cl. H05k *3/00*
U.S. Cl. 117—212 5 Claims



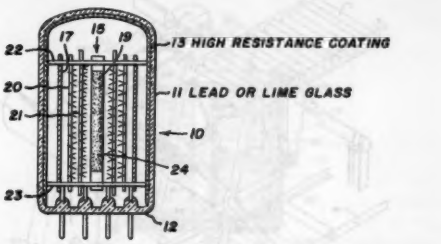
A method of applying a resist coating to the surface of a circuit board or the like having a plurality of holes therethrough in which the board is assembled over an opening in a pressurized fixture with the periphery of the board in fluidtight relationship with the periphery of the opening to cause the pressurizing fluid to flow through the holes and outwardly of the exposed surface of the board. Under these conditions, a coating of resist is applied to the exposed surface in any suitable manner known to the art with the fluid flowing through the holes preventing the flow of resist into the holes and keeping the holes open. At locations at which the board has relatively large holes, posts or pins on the fixture extend upwardly through the central portions of the openings to the surface of the board, the size of the posts being such as to fill the centers of the holes while leaving annular spaces therearound for the flow of fluid.

3,579,377
METHOD OF PRODUCING TIN OR TIN-ALLOY COATED COPPER JUMP WIRE BY MEANS OF HOT METALIZING
Horst Schreiner, Nuremberg, and Helmut Ohmann, Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Filed Apr. 25, 1968, Ser. No. 724,012
Claims priority, application Germany, Apr. 29, 1967, S 109,665
Int. Cl. B44d *1/44*; C23c *1/04*
U.S. Cl. 117—217 7 Claims



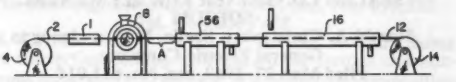
Described is a method of producing copper wire, uniformly coated around its periphery with tin or a predominantly tin-containing alloy, by hot metalizing. In this method a scraping die is placed at such a distance from the surface of the bath of tin or a predominantly tin-containing alloy, that the scraping die is positioned just within the solidification range of the bath component.

3,579,378
METHOD OF COATING AN ELECTRIC DISCHARGE DEVICE
Walter T. Millis, Owensboro, Ky., assignor to General Electric Company
Division of application Ser. No. 531,082, Mar. 2, 1966, now Patent No. 3,465,196. Continuation-in-part of application Ser. No. 302,490, Aug. 9, 1963. This application Nov. 12, 1968, Ser. No. 798,830
Int. Cl. C23d *5/04*
U.S. Cl. 117—229 1 Claim



A method of making an electric discharge device having a vitreous coating on the interior of the envelope is described. The vitreous coating inhibits the release of occluded gases from the envelope which upon release would adversely affect the operation and life of the device.

3,579,379
PROCESS FOR PRODUCING CONDUCTORS INSULATED WITH POLYETHYLENE TEREPHTHALATE
Franciscus C. A. A. van Berkel, 8 Deerfield Road, Asheville, N.C., and Stanley F. Luques, Lakeview Drive, Columbia, Conn.
Filed Dec. 1, 1966, Ser. No. 598,276
Int. Cl. B44d *1/09, 1/18*; C09d *3/48*
U.S. Cl. 117—232 8 Claims



Process for producing insulated electrical conductors comprising applying a coating of polymeric ethylene terephthalate to electrical conductors, the improvement comprising (1) utilizing molten polyethylene terephthalate having an initial relative viscosity of at least 1.80 and containing from 0.01 to 5% by weight of a liquid crystallization promoting compound, (2) followed by cooling the coating and then (3) heating the cooled coating to a temperature of at least 100° C. to effect a crystallization of at least 15% in said polymeric coating. In the practice of this process, lengthy injection molding cycles and/or unduly long cooling cycles are avoided.

3,579,380
PROCESS FOR THE PRODUCTION OF XYLOSE SOLUTIONS
Hermann Friese, Hamburg, Germany, assignor to Sud-Chemie AG, Munich, Germany
No Drawing. Filed Dec. 4, 1969, Ser. No. 882,318
Int. Cl. C13k *9/00*
U.S. Cl. 127—37 7 Claims

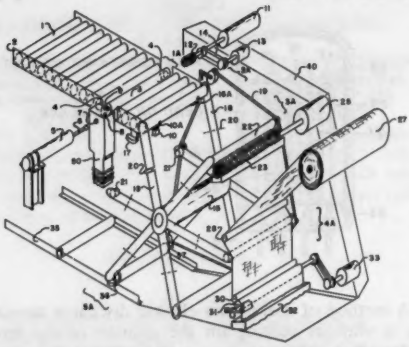
Xylose solutions free from crystallization-inhibiting substances are obtained, without any pre-treatment steps, from stone fruit shells such as of coconut, walnut and apricot, peach or plum pits by hydrolysis with aqueous mineral acids followed by separation from undissolved reaction residue and decolorizing.

3,579,381

AUTOMATIC BOBBIN AND PIRN CLEANING

Lawrence L. Bailey and Donel C. Autin, Columbia, S.C., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Oct. 25, 1968, Ser. No. 770,557
Int. Cl. B08b *1/02*
U.S. Cl. 134—8 15 Claims



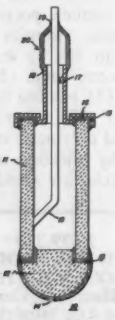
An improved method and apparatus for cleaning textile bobbins or pirns involving the steps of removal of merge disc, removal of metallic scale or dust from the core, and cleaning and drying of the exterior for surface of the bobbin or pirn as an automated combined operation wherein the sequence of continuous feed, merge disc removal, dry core cleaning and loading and discharge of the pirn or bobbin surface after cleaning and drying is an automatic, continuous and high-speed operation which is adapted to clean bobbins and pirns with a range of internal and external diameters and lengths.

3,579,382

SEALED CONTAINER FOR ELEMENTAL SODIUM

Harold A. Christopher, Scotia, N.Y., assignor to General Electric Company

Filed Mar. 27, 1969, Ser. No. 811,014
Int. Cl. H01m *35/02*
U.S. Cl. 136—20 2 Claims



An evacuated, sealed container for pure elemental sodium is disclosed which has an open-ended casing of an ionic conducting material sealed at one end with a high temperature ceramic plug by means of a high melting point sodium resistant glass, an electronic conductor in contact with the interior surface of the ionic conducting material and extending outwardly from the casing, and a seal at the other end of the casing. Such a container provides a suitable device for storing and dispensing pure elemental sodium, or provides a sodium electrode with an associated ionic conducting electrolyte. Methods are also described for forming evacuated, sealed containers for pure elemental sodium.

3,579,383

PROCESS FOR ACTIVATING METAL FOIL FOR USE AS A POSITIVE ELECTRODE IN ALKALINE STORAGE BATTERIES

Trevor Stanley Turner, Kidderminster, England, assignor to The International Nickel Company, Inc., New York, N.Y.

No Drawing. Filed July 16, 1969, Ser. No. 842,347
Claims priority, application Great Britain, Aug. 2, 1968, 37,295/68; Apr. 3, 1969, 17,617/69
Int. Cl. H01m *35/30, 43/04*
U.S. Cl. 136—76 9 Claims

Process for activating a metal surface, e.g., nickel foil, for use as the positive electrodes in alkaline storage batteries, in which the foil is immersed in a bath containing a nickel ammine complex and then made the anode in an electrolytic treatment during which current is passed through the bath to deposit the battery active mass on the metal. A high capacity activated metal foil is also disclosed.

3,579,384

ELECTRIC CURRENT-PRODUCING CELLS

Sandors G. Abens, Philadelphia, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

No Drawing. Filed Mar. 19, 1969, Ser. No. 808,650
Int. Cl. H01m *17/02*
U.S. Cl. 136—100 6 Claims

An improved current-producing cell system wherein the electrolyte comprises a solution of lithium-hexofluoroarsenate in methyl formate and the cathode is copper fluoride. The novel cell consists essentially of a lithium metal anode, a copper fluoride cathode, and an electrolyte solution of lithium-hexofluoroarsenate in methyl formate.

3,579,385

METHOD OF IMPREGNATING METALLIC FIBER BATTERY ELECTRODES

William Feduska, Edgeworth, and Jack T. Brown, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of application Ser. No. 764,461, Oct. 2, 1968. This application Apr. 13, 1970, Ser. No. 28,179
Int. Cl. H01m *35/30, 43/04*
U.S. Cl. 136—75 6 Claims

A method of loading active material into flexible, bonded, metallic fiber, porous battery plaques, by a plurality of molten salt impregnation and electrolysis steps, for use as positive and negative electrodes in cells and batteries, wherein the active material is conditioned by an intermediate charging and/or intermediate charging and discharging formation step. The conditioning step is between the loading steps and causes the active material, precipitated during electrolysis, to compact against and between the flexible metal fibers, opening the pores of the plaque and allowing additional loading at a high rate in subsequent impregnation-electrolysis steps.

3,579,386

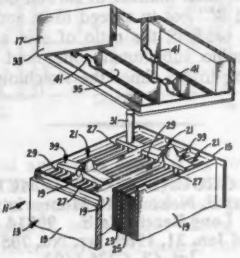
INTERCELL CONNECTORS IN BATTERIES AND METHOD OF FORMING SAME

Ernest G. Tiegel, Redwood City, and Ralph G. Tiegel, San Carlos, Calif., assignors to Tiegel Manufacturing Co., Belmont, Calif.

Filed Oct. 22, 1965, Ser. No. 501,037
Int. Cl. H01m *13/10*
U.S. Cl. 136—134 16 Claims

Leakproof electric stroage battery intercell connectors passing through the cell divider wall, and method and

apparatus for forming such connectors by a cast-on process while the plates are in place in the cells of the battery. The connector is slotted in its lower surface to mate with the upper surface of the divider wall and ridged on its upper surface to mate with a corresponding recess in the battery cover, which extends down to a partline approximately at the level of the tops of the plates. The connector is thickened throughout the portion bridging the divider wall by being tapered laterally outwardly, and is sealed to the divider wall and depending portions of the cover by



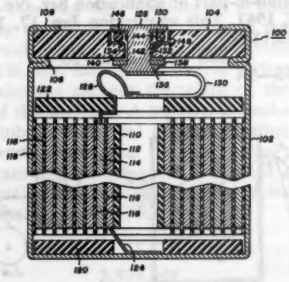
cementing material, which may be thermoplastic. Alternate forms are shown having a plurality of ridges and grooves in the upper and lower surfaces of the connector. The molding apparatus grips and inverts the battery case with the plates in place and then elevates a mold filled with molten lead into contact with the lugs of the plates to cast the connector onto the lugs and soften the cementing material. The mold is then chilled by fluid passing through an internal passageway and lowered away from the finished connector.

3,579,387

SEALED AQUEOUS ALKALINE ELECTROLYTE CELLS WITH CREEP BARRIERS

Peter R. Voyentzie and Robert J. Lehnen, Gainesville, Fla., assignors to General Electric Company

Filed Aug. 12, 1968, Ser. No. 751,968
Int. Cl. H01m *1/02*
U.S. Cl. 136—163 **2 Claims**



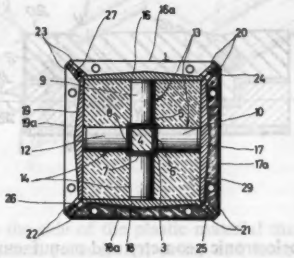
A sealed cell having an aqueous alkaline electrolyte may be protected from leakage by interposing a creep barrier within the creep path of the electrolyte. Alpha,alpha-dihydroperfluoroacrylate polymers have been found to be superior creep barriers when used as an adherent layer intersecting the creep path. The creep barrier may be interposed between an O-ring seal and its seat in a vented cell construction.

3,579,388

MODULAR THERMOGENERATOR

Paul Zahn, Ottobrunn, and Veit Merges, Munich, Germany, assignors to Bolkow Gesellschaft mit beschrankter Haftung, Ottobrunn, Germany

Filed Apr. 11, 1968, Ser. No. 720,662
Claims priority, application Germany, Apr. 29, 1967, B 92,311
Int. Cl. G21h *1/10*
U.S. Cl. 136—202 **10 Claims**



A thermogenerator includes a selected number of identical modules mechanically and electrically assembled to form the thermogenerator. Each module includes at least two thermocouple elements having hot ends in thermal contact with a common heat source, such as a radioactive heat source, and cold outer ends in contact with cooling surfaces or radiators. The modules have outer walls permitting assembly of plural modules to form the modular thermogenerator.

3,579,389

HIGH FREE-ACID IRON PHOSPHATE CONVERSION COATING COMPOSITION AND METHOD

George D. Howell, Alton, Ill., and Robert F. Ayres, Florissant, Mo., assignors to Electrolux Corporation, New York, N.Y.

No Drawing. Filed Oct. 31, 1967, Ser. No. 679,555
Int. Cl. C23f *7/08*
U.S. Cl. 148—6.15 **13 Claims**

A conversion coating composition for ferrous and nonferrous metal surfaces employing a phosphate composition is improved by the incorporation of ethylene diamine tetra acetates. An aqueous bath, having a relatively high free acid content, is made possible by the employment of ethylene diamine tetra acetic acid and/or its salts. The free acid to total acid ratio becomes functional even at a ratio as high as one to two, to promote the activity and accelerate the formation of uniform iron phosphate conversion coatings having a high degree of hardness, adherence and tenacity to the metal base.

3,579,390

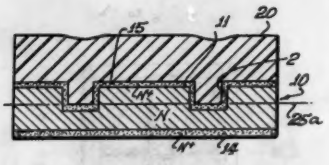
METHOD OF MAKING A CERMET

T. O. Paine, Acting Administrator of the National Aeronautics and Space Administration, with respect to an invention of Alexis I. Kaznoff, Castro Valley, and Mickey O. Marlow, Livermore, Calif.

No Drawing. Filed Dec. 20, 1968, Ser. No. 785,780
Int. Cl. C21d *1/00*
U.S. Cl. 148—126 **6 Claims**

A cermet in which ceramic particles dispersed in a metal matrix are uncoupled therefrom. The cermet is made by pressing metal coated ceramic particles in a die at a temperature sufficient to cause bonding of the metal coatings to one another. The cermet is then heat treated to mechanically uncouple the ceramic particles from the metal matrix whereby expansion of the cermet when heated is substantially the same as that of the metal matrix.

3,579,391
METHOD OF PRODUCING DIELECTRIC ISOLATION FOR MONOLITHIC CIRCUIT
James Lang Buie, Panorama City, Calif., assignor to TRW Inc., Redondo Beach, Calif.
Continuation-in-part of application Ser. No. 355,605, Mar. 30, 1964, now Patent No. 3,320,485. This application Jan. 5, 1967, Ser. No. 613,712
Int. Cl. H01l 7/36
U.S. Cl. 148—175 11 Claims



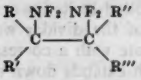
A microelectronic geometry and manufacturing process in which an electrode or region remote from the top surface of the substrate has a continuous portion deposited on the top surface to provide easier and better deposition or other emplacement of electrical contacts thereto. The method of producing dielectric isolation for one or more regions in the substrate includes the steps of cutting a groove in a semiconductor wafer surrounding the region to be isolated, establishing a highly conductive layer of semiconductor material on the top surface of the wafer and on all surfaces of the groove, establishing an insulating layer adjacent to the highly conductive layer, providing mechanical supporting substrate material to fill the groove and continue above the original top surface, and cutting off the original bottom portion along a line intersecting the bottoms of the groove and including the layer of conductive material on the bottom thereof so as to expose the insulating layer whereby when the wafer is inverted the exposed semiconductor material in the area surrounded by the groove will be dielectrically isolated by the insulating layer.

3,579,392
NITROGLYCERIN-NITROGLYCOL BLASTING COMPOSITION
Bertil Petrus Enoksson, Gyttorp, Sweden, assignor to Nitro Nobel Aktiebolag, Gyttorp, Sweden
Filed Nov. 27, 1968, Ser. No. 779,496
Claims priority, application Sweden, Nov. 27, 1967, 16,275/67
Int. Cl. C06b 1/04
U.S. Cl. 149—7 9 Claims

This invention relates to blasting compositions comprising a blasting oil, an inorganic nitrate and certain desensitizing agents. These compositions are less dangerous to manufacture, less dangerous to handle, and less impact sensitive yet have the same heat of explosion and the same blasting strength as ordinary straight dynamites.

3,579,393
MONOPROPELLANT COMPRISING CERTAIN DIFLUOROAMINO COMPOUNDS AND NITRIC ACID
Barry D. Allan, Huntsville, Ala., assignor to the United States of America as represented by the Secretary of the Army
No Drawing. Filed Jan. 28, 1963, Ser. No. 254,510
Int. Cl. C06b 7/00
U.S. Cl. 149—74 9 Claims

1. A liquid monopropellant composition comprising a mixture of a difluoroamino substituted compound of the formula:

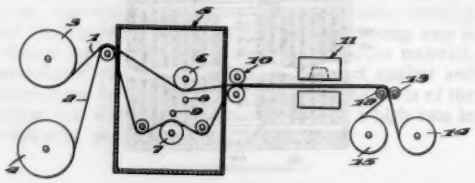


wherein R, R', R'', and R''' are each selected from the group consisting of alkyl, alkoxy, alkenoxy, carbalkoxy, carboxy, carbalkenoxy, alkanoyloxy, hydroxyalkyl, haloalkyl, alkoxyalkyl, and alkenyl, the total number of carbon atoms in R, R', R'', and R''' collectively not to exceed six and the total number of carbon atoms in each of R, R', R'', and R''' not to exceed four; and a white fuming nitric acid oxidant, the ratio of said acid oxidant to said difluoroamino substituted compound being from a trace amounting to 1.5 times the stoichiometric amount.

3,579,394
SOFT GROUND ETCHING METHOD
Robert F. Nelson, 410 Monrovia Ave., Long Beach, Calif. 90814
Filed Jan. 31, 1968, Ser. No. 705,882
Int. Cl. C23f 1/02
U.S. Cl. 156—10 6 Claims

In preparing a metal plate to produce a desired picture or other designs, a resistant material covers the plate against the action of acid, and these resistant materials, called soft ground, are picked off to bare the metal plate so that the plate will be etched by the acid. The soft ground is a sticky substance which will adhere to the pattern on a cover sheet extending over the metal plate, which is called the resist. The pattern on the cover sheet may be formed in many shapes, and the protruding pattern of the sheet will pick off spots or areas of the soft ground when the sheet is pressed into engagement with the soft ground by means of a manually operated stylus. Subsequent treatment of the metal plate with a suitable acid will etch the areas picked off by the sheet and thus form the outlines of the picture or other subject.

3,579,395
METHOD AND APPARATUS FOR FORMING A MULTI-PLY THERMOPLASTIC MOLDED ARTICLE
Paul S. Rath, West Hartford, Conn., assignor to Monsanto Company, St. Louis, Mo.
Continuation-in-part of application Ser. No. 158,643, Dec. 6, 1961. This application Jan. 17, 1967, Ser. No. 632,118
Int. Cl. B32b 31/20
U.S. Cl. 156—94 8 Claims



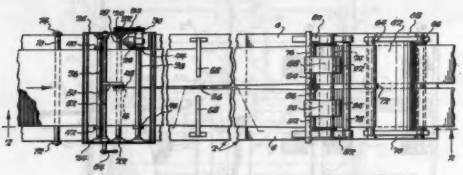
A method and apparatus for forming a rigid, laminated thermoplastic article, by treating the surfaces of plastic sheets to render them hydrophilic, pressing the treated surfaces together to form a semi-rigid, block-bonded laminate, and molding the semi-rigid laminate to form the rigid article.

3,579,396

METHOD FOR PRODUCING ROLLED EDGE BOARD

Robert L. Washburn, Whittier, and William J. Kruk, Fullerton, Calif., and William S. McDonald, Georgetown, S.C., assignors to International Paper Company, New York, N.Y.

Filed Oct. 3, 1968, Ser. No. 764,815
Int. Cl. B31f *5/00*
U.S. Cl. 156—202 1 Claim



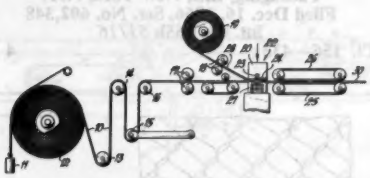
A method and apparatus for making strips of closed edge corrugated board with the edges of one facing sheet folded around the open ends of the corrugated core convolutions and secured to the other facing sheet from a sheet of single faced corrugated board, cut into strips.

3,579,397

PROCESS OF MANUFACTURING BAGS HAVING TEAR STRIPS AND CONSISTING OF SYNTHETIC THERMOPLASTICS

August Schwarzkopf, Lengerich, Westphalia, Germany, assignor to Windmoller & Holscher, Westphalia, Germany

Filed Aug. 7, 1967, Ser. No. 658,928
Claims priority, application Germany, Aug. 16, 1966, W 42,222; June 20, 1967, W 44,214
Int. Cl. B32b *31/10*
U.S. Cl. 156—251 6 Claims



A tubing length portion corresponding to the length of the desired bag, and flat sheeting in a length portion corresponding to the desired width of the tear strip, are fed during each cycle of the machine between the jaws of a transverse heat sealing and cutting station, the width of the flat sheeting exceeds the width of the tubing by the length of the tear tab. A transverse heat-sealed seam joining the tubing walls and the flat sheeting is formed during the working stroke of the heat sealing and cutting device. A transverse severing cut is effected at the same time at a small distance from the heat-sealed seam and behind the same in the direction of travel.

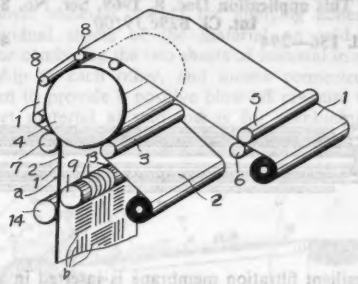
3,579,398

METHOD OF CURLING THERMOPLASTIC RESIN FILM INTO PIPES AND CONSTRUCTING UPHOLSTERY THEREWITH

Yasuhiro Oshima, 860 Kashida, Hagasiosaka, Osaka Prefecture, Japan

Filed July 23, 1968, Ser. No. 746,878
Int. Cl. B32b *31/00*
U.S. Cl. 156—250 4 Claims

Method of forming a decorative plastic material in which a thin plastic material is thermally expanded and sealed to another thin plastic material on a heated surface of a rotary cylinder to form a single laminated plastic film, which is simultaneously notched with a desired number of decorative patterns so that the notched portions



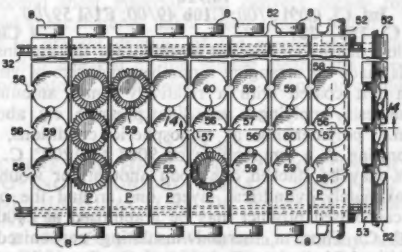
are curled to the side of the plastic material thereby supplying ornamental parts faster, easier and more economically, than prior art methods.

3,579,399

METHOD AND APPARATUS FOR ASSEMBLING A PLURALITY OF PAPER CUPS IN TRAY FORMATION AND GLUING THEM TOGETHER

Albert L. Ehe, Jamaica Estates, N.Y., assignor to Multicup Automation Company, Inc., Long Island City, N.Y.

Filed Nov. 22, 1968, Ser. No. 778,233
Int. Cl. B31b *31/12*; B32b *1/62*
U.S. Cl. 156—293 6 Claims



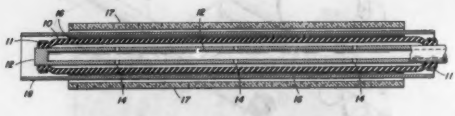
A method of assembling a plurality of paper cups in tray formation and gluing them together in said assembled relation together with apparatus for carrying out the method. The method consists essentially of the steps of: arranging a plurality of paper cups in a series of tray units, each of a predetermined cup number and formation, moving said tray units through a gluing station at which the cups are held in position relative to one another; applying glue to engaging cup portions; and discharging finished trays. The apparatus comprises, as characteristic elements an endless conveyor; cup receiving plates carried by the conveyor; a gluing station including a supply of heated glue below the upper ply of the conveyor, devices for holding cups in position in the plates while glue is applied, and glue applying means in the form of a gang of upright pile coated wires; means for indexing the conveyor with a stepped motion; mechanism for operating the cups holding devices and glue applying means in proper relation to movement of the conveyor, and a block out device for rendering the gluing means ineffective on certain predetermined steps to provide trays in a separated state.

3,579,400

METHOD OF POSITIONING A MEMBRANE

Anthony J. Kanyok, East Hanover, and William H. Keller, New Brunswick, N.J., assignors to American Standard Inc., New York, N.Y.

Continuation of application Ser. No. 640,304, May 22, 1967. This application Dec. 8, 1969, Ser. No. 880,465
Int. Cl. B29c *19/00*
U.S. Cl. 156—294 4 Claims



A resilient filtration membrane is inserted in a porous support tube by wrapping the membrane around a resilient tubular member, and holding the membrane in place around the tubular member while inserting the membrane and resilient tubular member into the porous support tube. The resilient member is expanded under fluid pressure and then returned to its normal state leaving the membrane against the interior wall of the porous support.

3,579,401

PROCESS FOR PRODUCING THERMAL INSULATING CARBONIZED FELT LAMINATED ASSEMBLIES

Roland Cauville and Andre Pernollet, Paris, and Gilberte Moutaud, Neuilly-sur-Seine, France, assignors to Societe le Carbone Lorraine, Paris, France

No Drawing. Filed June 30, 1967, Ser. No. 650,191
Claims priority, application France, July 26, 1966, 70,918
Int. Cl. C09j *5/00*; C10b *49/00*; F16l *59/00*
U.S. Cl. 156—327 4 Claims

A low density carbon felt assembly for thermal insulation is made by arranging a number of layers of viscose rayon felt coated with a relatively small amount of furane resin, applying a very light pressure, e.g. about 5 g./cm.^{2}, polymerising at atmospheric conditions, and carbonising at a temperature of 900° to 1200° C. The layers may be stacked one upon another, or wound in approximately cylindrical layers one around the other. The carbonised product may be graphitised at 2400° to 3000° C. Thus, a thermal insulating carbonized or graphitized viscose rayon having a density of less than 0.485 gm./cm.^{3} is produced.

3,579,402

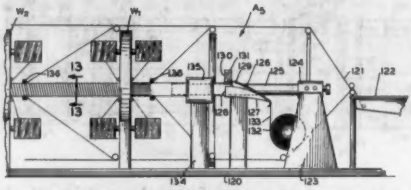
METHOD AND APPARATUS FOR PRODUCING FILAMENT REINFORCED TUBULAR PRODUCTS ON A CONTINUOUS BASIS

William B. Goldsworthy, Palos Verdes, and Ethridge E. Hardesty, Pine Valley, Calif., assignors to Goldsworthy Engineering, Inc.

Continuation-in-part of application Ser. No. 633,146, Apr. 24, 1967. This application Apr. 23, 1968, Ser. No. 723,554
Int. Cl. B65h *81/02*
U.S. Cl. 156—392 19 Claims

A device for making filament reinforced tubular products in a continuous manner. The device includes a series of filament spools. Filaments from the spools are passed through a resin tank and around a fixed mandrel to form the longitudinal strands of the tube. The mandrel has substantially the same internal size and shape of the continuous tube to be produced. The mandrel extends through a plurality of helical filament wrap devices which are designed to apply opposing helically wound strands of filament upon the interspersed layers of longitudinal strands. The mandrel extends also through a pair of circumferential filament wrap devices for laying outermost surface circumferential strands in opposite directions with respect to each other and superimposed upon the helical immediately proceeding final strands. The several layers of such strands which have been wound on the fixed mandrel are urged into the R. F. curing zone on the mandrel which also extends into the curing zone. After the resin matrix has been cured, the finally formed and cured tube is pulled from the mandrel by a pulling unit.

A number of embodiments are disclosed for making continuously wound pipe. In another embodiment, the device is mounted on a moving vehicle such as a boat where pipe which is continuously made is deposited from the moving vehicle. In an additional embodiment of the invention, a rectangular mandrel is employed for wrapping tube-like sections having a somewhat rectangular cross section, capable of being used in the construction of ladder rails and similar structural elements.

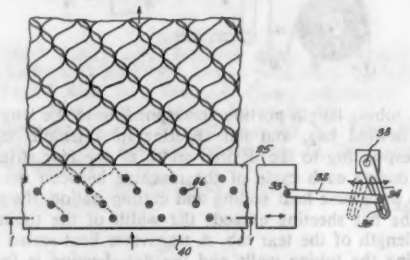


3,579,403

APPARATUS FOR MAKING COMPOSITE FILAMENT OR FIBER THERMOPLASTIC PRODUCTS

John Henry Stroop, New York, N.Y., assignor to Total Packaging, Inc., New York, N.Y.

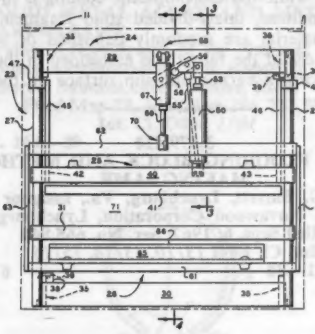
Filed Dec. 16, 1966, Ser. No. 602,348
Int. Cl. B65h *51/16*
U.S. Cl. 156—433 4 Claims



Paper is ordinarily produced by a Fourdrinier process and apparatus, and textile fabrics are produced by spinning and weaving. This invention has many of the advantages of each and utilizes a plurality of multi-product spinner nozzles. A plate on which the spinner nozzles are mounted is reciprocated so that filaments discharged from the plurality of spinner nozzles are overlaid and produce a thermoplastic fabric. The filaments are composed of more than one material and are called composite filaments.

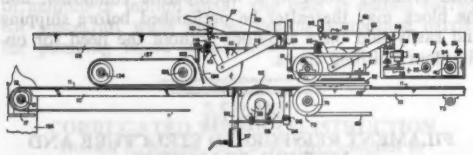
A modification provides a box containing a plurality of cut fibers which are advanced by a carding loom picker. One of the substances described in the first alternative as discharged from the spinner nozzles is in this alternative sprayed onto a moving sheet which then proceeds through calendering and desired embossing, perforating and printing rolls.

3,579,404
CUTTING AND SEALING UNIT
Robert J. Spitznagel, Cincinnati, Ohio, assignor to Phillips Petroleum Company
Filed Mar. 6, 1969, Ser. No. 804,846
Int. Cl. B32b *31/20;* B65b *51/14, 51/30*
U.S. Cl. 156—515 5 Claims



A cutting and sealing unit for plastic packaging machines. The unit comprises three relatively movable frames, two of which include gripping jaws and the third, a heat sealing and cutting knife.

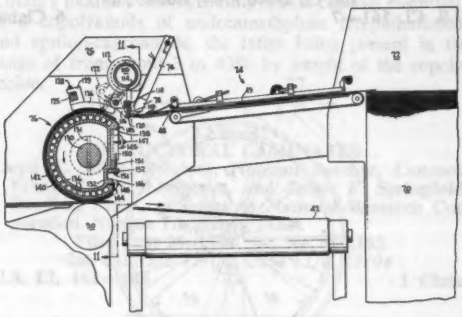
3,579,405
MACHINE FOR INTERCONNECTING VENEER PANELS
John H. Crawford, Corvallis, Oreg., assignor to Leading Plywood, Corvallis, Oreg.
Filed Apr. 9, 1968, Ser. No. 719,972
Int. Cl. B32b *31/12, 31/10*
U.S. Cl. 156—546 8 Claims



A machine for the application of continuous elements to a series of abutting veneer panels to interconnect contiguous panels for use in an article of manufacture. Means are disclosed for both conveying and positioning each of the panels into side-by-side relationship with an adjacent panel subsequent to which the continuous element is applied. Such means includes continuous belts disposed above and below the panels. The continuous elements disclosed is glue bearing and applied by wheels in rolling contact with the panels. For drying the glue bearing elements on said panels a directed air flow is provided.

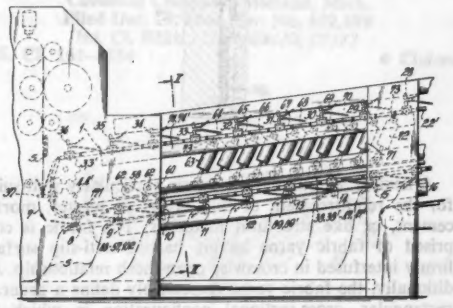
3,579,406
HIGH SPEED PRECISION COMBINER
William H. Eburn, Jr., Stamford, and Charles T. Raymond, Westport, Conn., assignors to Selchow & Righter Company, Bay Shore, N.Y.
Filed July 25, 1968, Ser. No. 747,689
Int. Cl. B65c *9/08;* B65h *1/22*
U.S. Cl. 156—571 13 Claims

Apparatus for combining two sets of sheet material in a registered relationship to one another includes separate means for feeding each set of sheet material in synchronization with one another, a number of gripping mechanisms for grasping the individual sheets of a first material to transport it onto a rotating drum mechanism wherein the gripping mechanisms accelerate from a position at rest to a speed substantially equal to the speed of rotation of the drum to deposit the first sheet material in a registered position thereon, a blanket mounted in registered position on the surface of the drum and having perforations for developing a vacuum to retain the individual sheet material, means for applying adhesive to the individual sheets of the material on said drum, means for combining the two sheets of material in aligned relationship to each other, and means connected with said drum to provide a positive blow-off pressure to said first sheet material at said means for combining. The



means for delivering the second sheet material includes a hopper for receiving and storing the material in vertically stacked relationship and means for sensing the height of the material to control the delivery of a second sheet material to the hopper. The delivery and hopper mechanisms are mounted on movable rails whereby those mechanisms can be elevated to disengage the second sheet material from a feeding mechanism in the absence of second sheet material. The delivery means for the second sheet material has a speed control which is regulated to prevent damage of the second sheet material when it is engaged by the driving means and when the second material is delivered to the means for combining.

3,579,407
MACHINE FOR HEAT SEALING CONTINUOUSLY MOVING WORK-MATERIAL SHEETING IN THE MANUFACTURE OF BAGS OF PLASTICS MATERIALS
Kurt Rochla, Lengerich, Westphalia, Germany, assignor to Windmoller & Holscher, Westphalia, Germany
Filed Aug. 15, 1968, Ser. No. 752,930
Claims priority, application Germany, Aug. 18, 1967, W 44,584
Int. Cl. B30b *15/34;* B32b *31/20*
U.S. Cl. 156—583 19 Claims



A plurality of heat sealing jaw sets are secured to endless conveyor chains and revolve at the velocity of the

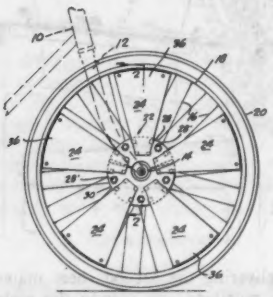
workpieces. A plurality of said heat sealing jaw sets are in action simultaneously. The heat sealing set is adapted to be energized in dependence on the machine cycle and to be de-energized by means of a timing element after a predetermined interval of time.

3,579,408

ORNAMENTAL DEVICE FOR ATTACHMENT TO WIRE SPOKED WHEELS

Wesley P. Dowhan, 46 N. Water St., P.O. Box 272, Warehouse Point, Conn. 06088

Filed June 21, 1968, Ser. No. 739,102
Int. Cl. D04d 7/04; B60b 7/04
U.S. Cl. 161—7 6 Claims



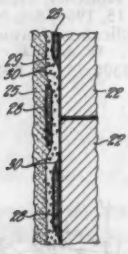
Ornamental device for attachment to a wheel having wire spokes, said device comprising: a central, segmented annular disc; a plurality of fan-shaped blades; means for connecting the small ends of said blades to said disc, and means securing the wide ends of said blades to the spokes of a wheel.

3,579,409

HIGH STRENGTH PLASTIC COATED FIBER YARN FABRIC FOR STRUCTURAL REINFORCEMENT

Richard F. Shannon, Lancaster, Ohio, assignor to Owens-Corning Fiberglas Corporation

Filed May 17, 1967, Ser. No. 639,069
Int. Cl. B32b 5/16
U.S. Cl. 161—39 18 Claims



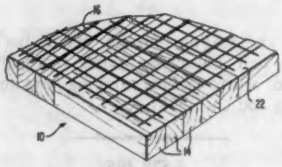
A flexible, extremely thin fabric particularly well-suited for the reinforcement of thin layers of plaster, mortar, cement, or like structural materials. The fabric is comprised of fabric yarns having barbed anti-slip surfaces firmly interfused in crosswise open-mesh relationship. Additionally, the fabric yarns respectively define a generally rectangular cross-sectional configuration in which the width across which the yarn is interfused is from approximately six to eighteen times greater than the yarn thickness. The method of producing the fabric involves heating an open-mesh fabric constructed from glass fiber yarns coated with a thermoplastic organic coating to a temperature sufficient to transform the thermoplastic coating to a heat-softened fusible condition. While the thermoplastic coating remains in a fusible condition, the fabric is compressed to flatten and interfuse the fabric yarns. Also, while the thermoplastic coating is in a heat-softened condition, finely-divided solid fragments of an inorganic material are randomly deposited or scattered on the surfaces of the fabric and embedded in the plastic coating to form a barbed anti-slip surface on the fabric.

3,579,410

PARQUET FLOORING BLOCK AND METHOD OF MAKING SAME

Lawrence G. Barrett, Lynchburg, Va., assignor to The American Novawood Corporation, Lynchburg, Va.

Filed Sept. 6, 1967, Ser. No. 665,860
Int. Cl. E04f 13/10, 13/18, 15/16
U.S. Cl. 161—38 6 Claims



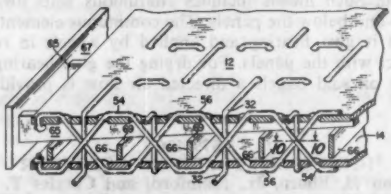
A prefinished unit of parquet booring impregnated throughout the total thickness thereof with a monomer that is polymerized to a plastic material having a high resistance to abrasive wear. The separate slats, which may be quite thin, are assembled in blocks prior to conversion from ordinary wood to a wood-plastic composite, and the block may thereafter be prefinished before shipping and easily laid on a sub-floor without the need for on-site floor finishing crews.

3,579,411

FILAMENT REINFORCED STRUCTURE AND METHOD OF MAKING

William L. Mackie, 394 Court Ave., and Edgar D. Wilson, 5239 Aurora Drive, both of Ventura, Calif. 93003

Filed Sept. 27, 1967, Ser. No. 671,157
Int. Cl. B32b 7/08
U.S. Cl. 161—53 1 Claim



A lightweight, high strength structure and method of making same. Spaced panels are interconnected by high tensile strength flexible filaments of glass fiber or metal which filaments penetrate through the panels, and are woven back and forth. The portions of the filaments extending between the panels are subsequently rigidized by the addition of a coating which, when solidified, imparts substantial compressive strength. To counter shear

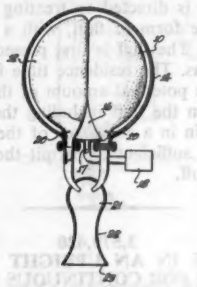
forces certain filaments may be arranged to slant in the direction of anticipated stress. Since the filaments pass through and overlie portions of the panels they effectively counter delamination or peeling.

3,579,412

FLUID IMPERVIOUS BARRIER INCLUDING LIQUID METAL ALLOY AND METHOD OF MAKING SAME

T. O. Paine, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Albert J. Bauman, Sierra Madre, Calif.

Filed May 29, 1968, Ser. No. 732,922
Int. Cl. D06q *1/04*
U.S. Cl. 161—89 15 Claims



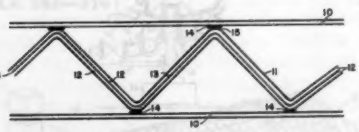
A flexible barrier membrane comprising a porous substrate and incorporated liquid metal provides structures highly impervious to gases and liquids, and self-sealing to small punctures. Fabrics of metal or synthetic textile are impregnated with low melting alloys, such as alloys of gallium or indium metal, and used as sealant barriers for spacecraft walls and as flexible membrane barriers for pumping liquid propellants.

3,579,413

CORRUGATED BOARD CONSTRUCTION

Russell E. Koons, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 3, 1966, Ser. No. 519,813
Int. Cl. B32b *11/06*
U.S. Cl. 161—135 3 Claims



Corrugated board materials having improved properties are made utilizing a corrugated sheet comprising a laminate of at least two corrugated sheets laminated together with an asphalt-wax composition. The composition is comprised of 80 to 97 weight percent asphalt and 3 to 20 weight percent petroleum derived wax. The composition has a softening point of from 170 to 230° F., a penetration at 32° F., 200 grams, 60 seconds of 15 to 30 mm./10, a penetration at 77° F., 100 grams, 5 seconds of 25 to 45 mm./10, a penetration at 115° F., 50 grams, 5 seconds of 40 to 70 mm./10 and a viscosity (Saybolt Furol) at 375° F. of 25 to 250 seconds.

3,579,414

POLYAMIDE CONJUGATE FILAMENT

Keizo Ueda, Nishinomiya, Tsuneo Ohkawahara, Hirakata, and Masao Matsui and Satoshi Ando, Osaka, Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan

No Drawing. Application Sept. 26, 1968, Ser. No. 768,956, now Patent No. 3,515,703, dated June 2, 1970, which is a continuation of application Ser. No. 368,691, May 19, 1964. Divided and this application Aug. 14, 1969, Ser. No. 871,232
Int. Cl. D02g *3/04*
U.S. Cl. 161—173 2 Claims

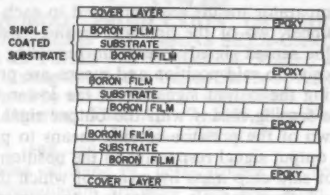
A drawn nylon filament having superior heat durability, Young's modulus and dyeability which consists essentially of a copolyamide of undecamethylene terephthalamide and epsilon-caproamide, the latter being present in the range of from about 3 to 40% by weight of the copolyamide.

3,579,415

STRUCTURAL LAMINATES

Lloyd R. Allen, Belmont, Norman Beecher, Concord, Frank Feakes, Lexington, and James F. Springfield, Reading, Mass., assignors to National Research Corporation, Newton Highlands, Mass.

Filed June 29, 1967, Ser. No. 650,103
Int. Cl. B32b *15/04;* C23c *13/0, 13/04*
U.S. Cl. 161—184 1 Claim



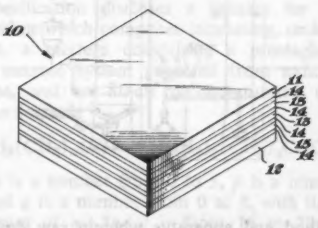
Lightweight structures of high specific modulus and specific strength (modulus of elasticity and ultimate strength, respectively, divided by density) can be achieved by structural laminates comprising rigid materials characterized by brittleness and high stiffness formed as films and laid up in laminates. The adjacent films of the laminates are secured to each other by adhesives or hot pressed self bonding. The liminates offer a significant advantage over the prior art filament and fiber reinforced composite systems in that the laminates offer their strength and rigidly in all directions in the plane of the laminate.

3,579,416

PACKAGING FILM COMPRISING POLYOLEFIN OUTER LAYERS AND PLURAL INNER GAS BARRIER LAYERS

Walter J. Schrenk, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 19, 1966, Ser. No. 602,899
Int. Cl. B32b *27/08, 27/30, 27/32*
U.S. Cl. 161—254 6 Claims



A packaging film is claimed which incorporates a gas barrier core such as vinylidene chloride polymer, the gas

barrier core is slit into a plurality of layers which provides improved barrier properties and crumple resistance over a single layer core.

3,579,417

CONTINUOUS DIGESTER WOOD CHIP LEVEL CONTROL

Lawrence Allan Carlsmith, Amherst, N.H., assignor to Improved Machinery Inc., Nashua, N.H.

Continuation of application Ser. No. 543,363, Apr. 18, 1966. This application May 12, 1969, Ser. No. 828,421
Int. Cl. D21c 3/26
U.S. Cl. 162—17 3 Claims

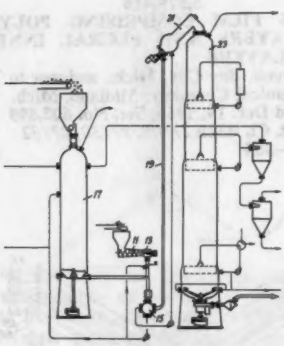
Apparatus and method for continuous pulping in an upright elongated reaction vessel by feeding substantially continuously wood chips and a liquid into the reaction vessel at its lower end to maintain therein a columnar mass of compacted wood chips with its lower end normally spaced upwardly from the lower end of the vessel and advancing the wood chips upwardly throughout the length of said column by advancing liquid upwardly through a liquid propelling zone in the lower portion of the column. The vessel has three vertically spaced pressure sensing means with the lower two of the pressure sensing means spaced respectively above and below the normal position of the lower end of the chip mass and the uppermost one of the pressure sensing means spaced above said lower two to sense said position for control thereof. Comparator means are connected to each of the lower and upper two of the pressure sensing means for comparing the sensed signals therefrom providing output signals resposive to said position and means are provided for comparing the output signal from the lower two of the pressure sensing means with the output signal from the upper two of the pressure sensing means to produce a corrected output signal responsive to the position of the lower end of said chip mass by means of which the propelling liquid flow rate is controlled to control said position.

3,579,418

METHOD AND APPARATUS FOR COMMON DIGESTION OF WOOD CHIPS AND SAW DUST

Bengt Sven Erik Ostberg, Karlstad, Sweden, assignor to Aktiebolaget Kamyr, Karlstad, Sweden

Filed Sept. 18, 1968, Ser. No. 760,487
Claims priority, application Sweden, Sept. 21, 1967, 12,989/67
Int. Cl. D21c 7/06
U.S. Cl. 162—18 6 Claims



A method and apparatus wherein saw dust is mixed with regular wood chips and digested. In order to prevent clogging of the screens in the chips feeding devices and the digester, coherent bodies, for example pellets or plugs, are formed out of the saw dust by compression. The cohesion of the bodies may be further improved by adding an adhesive or cementing agent. The saw dust bodies are added to the chips in the chute of the high-pressure feeder valve and are fed to the digester top by circulating liquid.

3,579,419

TREATMENT OF FLUFFED PULP FIBERS WITH GASEOUS CHLORINE

Frederic H. Yorston, Montreal, Quebec, and Norman Liebergott, Chomedey, Laval, Quebec, Canada, assignors to Pulp and Paper Research Institute of Canada, Pointe Claire, Quebec, Canada

Filed Apr. 24, 1967, Ser. No. 633,292
Int. Cl. D21c 9/12
U.S. Cl. 162—66 6 Claims

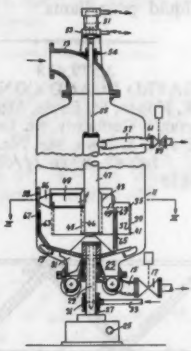
The invention is directed to treating a solid, such as wood pulp in the form of fluff, with a gaseous reactant such as chlorine. The fluff is first passed through a zone containing the gas. The residence time is limited to such that less than the potential amount of the gas is acquired by the fluff. Then the fluff including the acquired gas is allowed to remain in a zone free of the treating gas for a length of time sufficient to permit the acquired gas to react with the fluff.

3,579,420

SIEVE DEVICE IN AN UPRIGHT CYLINDRICAL CONTAINER FOR CONTINUOUS FLOW OF CELLULOSIC MATERIAL

Johan C. F. C. Richter, St. Jean Cap Ferrat, France, assignor to Aktiebolaget Kamyr, Karlstad, Sweden

Filed Apr. 30, 1968, Ser. No. 725,287
Claims priority, application Sweden, May 5, 1967, 6,340/67
Int. Cl. D21c 7/00
U.S. Cl. 162—237 1 Claim



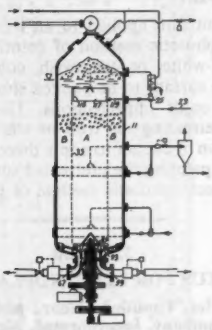
At least one hollow sieve body having coaxial cylindrical sieve faces is located near the lower end of a cylindrical container through which a mixture of cellulosic material and a treating liquid is passed vertically downwards. The sieve body is suspended by a vertical tube located centrally of the container which tube further serves for discharging filtrate from the interior of the sieve body. An operating means at the top of the container periodically lifts the sieve body, which, intermediate of the periodic lifts, moves downwardly with the cellulosic material. The sieve body is given stability by radial support arms which slidably communicate with guide means fixed to the inner side of the container.

3,579,421

CONTINUOUS CELLULOSE DIGESTER WITH TWO SEPARATE PULP OUTLETS

Johan C. F. C. Richter, St. Jean Cap Ferrat, France, assignor to Aktiebolaget Kamyr, Karlstad, Sweden

Filed May 13, 1968, Ser. No. 728,396
Claims priority, application Sweden, May 16, 1967, 6,788/67
Int. Cl. D21c 7/08
U.S. Cl. 162—237 8 Claims



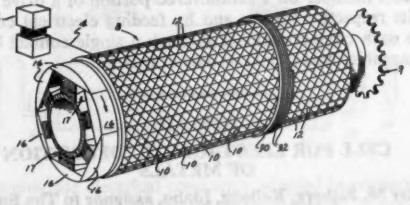
A continuous cellulose digester is provided with two pulp discharging means, one discharging the core of the moving plug of cellulosic material through a first outlet and the other discharging the peripheral parts of the plug through a second outlet. The first discharging means may be a rotary scraper working in the center area only of the outlet end of the digester, the second discharging means working in the surrounding annular space. The first outlet and discharging means is separated from the second outlet and discharging means by a partition means which is concentric to the digester wall.

3,579,422

FILAMENT WOUND CYLINDRICAL STRUCTURES FOR USE IN PAPER MAKING

David G. Minick, Westfield, and David H. Sinclair, South Hadley, Mass., assignors to The Sinclair Company, Holyoke, Mass.

Filed Oct. 7, 1968, Ser. No. 765,487
Int. Cl. D21f 1/46
U.S. Cl. 162—314 8 Claims



Cylindrical structure, such as a "dandy roll," constructed by the method of continuous filament winding in a honeycomb or open-work pattern formed on a collapsible mandrel. The filaments are impregnated with a thermosetting resin at the time of their application to the mandrel and the resin is cured and hardened to provide the open-work rib structure. In one embodiment the structure is composed of upstanding ribs formed on the dandy roll and bonded together in a hexagonal-triangular honeycomb pattern.

3,579,423

PREPARATION OF TISSUE CULTURE MEDIA

Isao Yamane and Yutaka Matsuya, Sendai, and Katsuhiko Jimbo, Saitama, Japan, assignors to Flow Laboratories, Inc., Rockville, Md.

No Drawing. Filed Dec. 13, 1968, Ser. No. 784,296
Int. Cl. A61k 27/00
U.S. Cl. 195—1.7 11 Claims

A powdered nutrient composition is provided containing most of the nutrition requirements for culturing animal cells and an acidic buffering agent to maintain the pH of an aqueous solution of the composition at 3.5–5.0. This composition can be dissolved in water and sterilized by autoclaving prior to its incorporation in a tissue culture medium. After autoclaving of the nutrient composition, sterile solutions of glutamine and bicarbonate ions are aseptically added to the composition to form a tissue culture medium.

3,579,424

MICROBIAL PRODUCTION OF CARBON ^{14}C LABELLED ALL-TRANS BETA-CAROTENE

Albert E. Purcell and William M. Walter, Jr., Raleigh, N.C., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Apr. 7, 1969, Ser. No. 814,526
Int. Cl. C12d 5/00
U.S. Cl. 195—28 4 Claims

Purified all-trans ^{14}C beta-carotene has been prepared in multimilligram amounts with over three million ^{14}C disintegration per minute per milligram. This process utilizes economical radioactive substrates more efficiently than processes of the prior art. Better than 1% ^{14}C tagged atom goes into beta-carotene. The labeled (^{14}C beta-carotene) obtained can be used as a tracer in studies of autooxidation in food products and metabolisms of beta-carotene and vitamin A in animals.

3,579,425

PREPARATION OF PROSTAGLANDINS

David Adriaan van Dorp and Roelof Karel Beerthuis, Vlaardingen, Diederik Hendrik Nugteren, Rhoon, and Hendrik Vonkeman, Maassluis, Netherlands, assignors to Unilever N.V., Rotterdam, Netherlands

No Drawing. Continuation-in-part of application Ser. No. 700,030, Jan. 24, 1968, which is a continuation-in-part of application Ser. No. 453,483, May 5, 1965. This application Aug. 29, 1969, Ser. No. 854,250
Claims priority, application Great Britain, May 8, 1964, 19,237/64; July 15, 1964, 29,052/64
Int. Cl. C12d 1/02
U.S. Cl. 195—30 21 Claims

The specification discloses a process for preparing prostaglandins which comprises incubating, under aerobic conditions, a mixture comprising a prostaglandin-synthesizing enzyme system prepared from animal tissue, glutathione, and an all-cis polyunsaturated carboxylic acid of the formula

$$CH_3(CH_2)_n(CH{=}CHCH_2)_p(CH_2)_qCOOH$$

wherein n is a number from 0 to 5, p is a number from 3 to 5, and q is a number from 0 to 8, with the proviso that the sum of $n+3p+q$ is from 16 to 20 and that when p is 3 then n is a number from 3 to 5. The enzyme system is obtained from living animal organ cells, e.g., thymus, iris, genital glands and the like.

3,579,426

MICROBIOLOGICAL DEMETHYLATION OF 7-HALO-7-DEOXYLINCOMYCINS

Alexander D. Argoudelis, John H. Coats, Donald J. Mason, and Oldrich K. Sebek, Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Oct. 21, 1968, Ser. No. 769,411

Int. Cl. C12d *9/00*

U.S. Cl. 195—80 7 Claims

A microbiological process for the 1'-demethylation of 7-halo-7-deoxylincomycins to obtain the corresponding 7-halo-7-deoxy-1-demethyllincomycins, which are known active antibacterial agents with broader scope of activity than the present compounds.

3,579,427

PROCESS FOR PRODUCING METHIONINE DECARBOXYLASE

Kiyoshi Nakayama, Sagamihara-shi, and Hiroshi Hagino, Hachioji-shi, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

No Drawing. Filed Feb. 13, 1968, Ser. No. 704,992

Claims priority, application Japan, Feb. 20, 1967, 42/10,419

Int. Cl. C12d *13/10*

U.S. Cl. 195—66 9 Claims

A process for producing the enzyme methionine decarboxylase which comprises culturing a microorganism capable of producing methionine decarboxylase under aerobic conditions in an aqueous nutrient medium containing L-methionine, accumulating the methionine decarboxylase in the resultant culture liquor, and recovering the same therefrom. Suitable microorganisms which may be employed are those belonging to the genus Streptomyces.

3,579,428

METHOD OF MANUFACTURING PLATED POLYPROPYLENE SHAPED ARTICLES

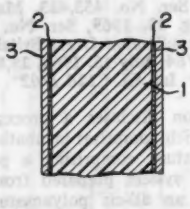
Toshihiko Kuroda, Sotoo Sutani, Haruo Nitta, Rikio Takahashi, and Sadao Saito, Yokkaichi-shi, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Sept. 23, 1968, Ser. No. 761,767

Claims priority, application Japan, Sept. 30, 1967, 42/62,648; June 17, 1968, 43/41,335

Int. Cl. C23b *5/60, 3/02*

U.S. Cl. 204—30 1 Claim



Method of manufacturing a plated polypropylene which comprises subjecting a polypropylene composition containing 20–50% by weight of an inorganic powder having an average particle size of less than 20 microns based on the total weight of said composition to a treatment with an acid solution containing an oxidizing agent and further subjecting thus treated polypropylene composition to a plating process.

3,579,429

PROCESS FOR APPLYING A WHITE PAINT ELECTROPHORETICALLY

Frank E. Manson, Lansdale, and Lester Steinbrecher, Southampton, Pa., assignors to Amchem Products, Inc., Ambler, Pa.

No Drawing. Continuation-in-part of application Ser. No. 630,839, Apr. 14, 1967. This application Jan. 6, 1970, Ser. No. 1,056

Int. Cl. B01k *5/02*; C23b *13/00*

U.S. Cl. 204—181 20 Claims

A white paint film applied to an iron or steel surface by the electrophoretic method of painting tends to be of a muddy, off-white or yellowish color; also, foreign deposits on the surface to be painted show-up in the white paint film as color imperfections. These problems are avoided by pretreating the iron or steel surface with an aqueous solution of copper to apply thereto copper deposits and thereafter painting the pretreated surface with a white paint by the electrophoretic method of painting.

3,579,430

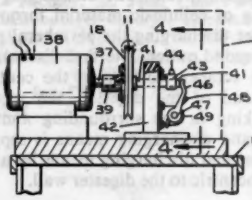
APPARATUS FOR ELECTROPLATING WIRE

Philip E. Lawler, Papillion, Nebr., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Mar. 13, 1969, Ser. No. 806,899

Int. Cl. C23b *5/08*

U.S. Cl. 204—206 5 Claims



In apparatus for electroplating wire, in which the wire is advanced longitudinally through a plating tank, the wire passes over electrical contact members mounted externally of the plating tank adjacent its wire entrance and wire exit ends. The contact members are rotatably driven by separate adjustable torque motors so as to maintain the wire under tension and thereby maintain good electrical contact between the wire and the contact members. In order that the tension in the wire, and thus the plating current flowing in the system, will be maintained at substantially uniform values, the magnitude of friction variables in the system is reduced by fixedly mounting each contact member on a cantilevered portion of a drive shaft of its respective motor, and by feeding electrical current into each contact member through a single contact brush engageable therewith at its axis of rotation.

3,579,431

CELL FOR ELECTROLYTIC DEPOSITION OF METALS

Peter M. Jasberg, Kellogg, Idaho, assignor to The Bunker Hill Company, Kellogg, Idaho

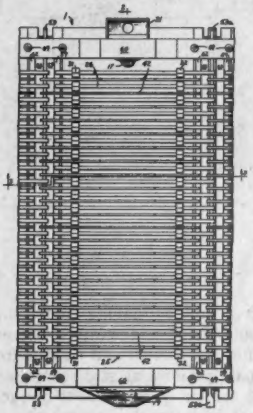
Filed Feb. 23, 1968, Ser. No. 707,847

Int. Cl. B01k *3/00, 3/02*

U.S. Cl. 204—275 18 Claims

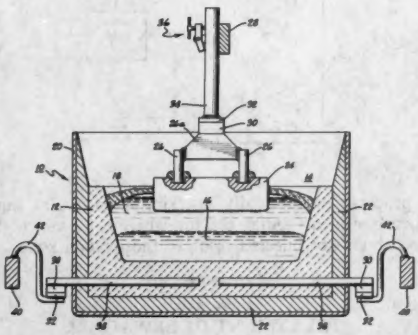
A cell assembly for electrolytic deposition of metals, designed to facilitate the electrolytic deposition and recovery of zinc or other metals similarly processed. The

cell assembly includes an improved cell box comprising a treated wooden structure having a one piece protective liner. The liner includes an integral inlet box and outlet weir to insure consistent solution line elevation. An improved cathode structure is utilized, having protective non-conductive coverings applied thereto along the side and top portions of the plate on which metal is deposited.



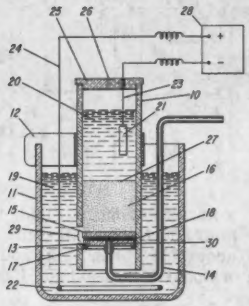
Improved anode assemblies include stiffening plastic guides attached thereto which position the cathodes relative to the anode structures in a constant spaced parallel relationship. Control of the deposition of metal is further achieved by an improved bus bar support system for the cathode and anode units, facilitating accurate adjustment and leveling of the units relative to the electrolyte.

3,579,432
ELECTROLYTIC REDUCTION CELL
Walter D. Finnegan, Spokane, Wash., assignor to Kaiser Auminum & Chemical Corporation, Oakland, Calif.
Filed Sept. 23, 1968, Ser. No. 761,421
Int. Cl. B01k *3/04;* **C23b** *5/70*
U.S. Cl. 204—279 **7 Claims**



A composite electrical conductor adapted to contact an electrode in current transmitting engagement. A ferrous metal plate is affixed to the free end of a ferrous metal rod adapted to be embedded in the electrode. A soft aluminous plate is roll bonded along one face to the ferrous plate affixed to the rod. An aluminum conductor rod is welded to the aluminous plate roll bonded to the ferrous plate and is adapted to be connected to a source of electric current.

3,579,433
VERTICAL COLUMN ELECTROPHORESIS APPARATUS
Donald A. Dahlgren, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
Filed Apr. 24, 1968, Ser. No. 723,658
Int. Cl. B01k *5/00*
U.S. Cl. 204—299 **6 Claims**



An apparatus for gel electrophoresis of proteinaceous materials includes an electrophoretic gel column, means to establish a substantially uniform unidirectional potential longitudinally across the column, and a collection chamber below the column. A buffer solution enters the collection chamber and radially sweeps the proteinaceous material entering the chamber from the column toward a centrally situated exit means and downwardly therethrough.

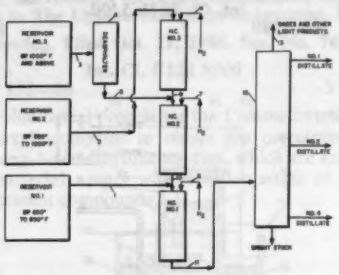
3,579,434
HYDROCRACKING OF NAPHTHA
Robert B. Smith, Pitman, and Barton W. Rope, Mullica Hill, N.J., assignors to Mobil Oil Corporation
No Drawing. Filed July 2, 1968, Ser. No. 741,867
Int. Cl. C10g *13/02, 13/10*
U.S. Cl. 208—111 **2 Claims**

A composition comprising a small quantity of palladium, generally between 0.05 and 5.0 weight percent palladium, deposited on a chelated hydrogen form of zeolite Y. A method of hydrocracking naphtha to LPG which comprises contacting a naphtha charge under hydrocracking conditions with the aforenoted catalyst.

3,579,435
HYDROCRACKING PROCESS
Albert T. Olenzak, Media, and Sheldon L. Thompson, Glen Mills, Pa., assignors to Sun Oil Company, Philadelphia, Pa.
Filed June 20, 1968, Ser. No. 738,432
Int. Cl. C10g *13/00, 37/02*
U.S. Cl. 208—59 **9 Claims**

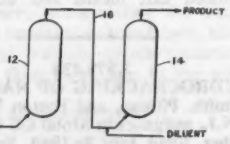
A process for hydrocracking lubricating oil stocks to lubricating oils of higher viscosity index in which the portions of a crude suitable for hydrocracking are fractionated into a plurality of fractions commensurate with the boiling point, molecular weight, or polyfused-ring aromatic content and each of said fractions is subjected to hydrocracking conditions commensurate with the polyfused-ring aromatic content over a hydrocracking catalyst at a temperature in the range of about 650° to 875° F. and a hydrogen partial pressure of at least about 1500 p.s.i. Preferably, the charge stock is fractionated into three fractions, the first fraction boiling in the range of about 650° to 850° F., the second fraction boiling in the range of about 850° to 1000° F., and the third fraction containing all the material boiling above about 1000° F. which has been deasphalted; and each of the foregoing

fractions is separately hydrocracked for at least a portion of the total time it is hydrocracked, preferably over a hydrocracking catalyst comprised of a sulfide of a Group VI metal, left-hand column, and/or an iron group metal, and



most preferably a mixture of nickel sulfide and tungsten sulfide in a 1/1 to 4/1 metal ion ratio, at a temperature in the range of about 735° to 825° F. and a hydrogen partial pressure of about 2500 to about 4000 p.s.i.

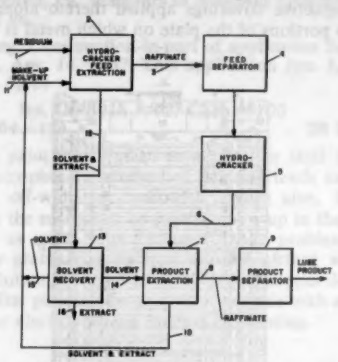
3,579,436
MULTISTAGE CONVERSION PROCESS
William R. Mounce, East Windsor Township, N.J., assignor to Cities Service Research and Development Company, New York, N.Y.
Filed June 30, 1969, Ser. No. 837,750
Int. Cl. C10g *13/00*
U.S. Cl. 208—59 **9 Claims**



A process for the efficient hydrocracking of a heavy hydrocarbon oil such as vacuum or atmospheric residuums is disclosed herein. The heavy oil is contacted with hydrogen in the presence of a particulate catalyst at high pressures, preferably between 1,500 and about 3,000 p.s.i., and high temperatures, preferably between 800° F. and 850° F., by passing the heavy oil and a hydrogen containing gas upwardly through the particulate catalyst in a first reactor. Effluent from the first reactor is mixed with a hydrocarbon diluent and passed upwardly through a catalyst bed in a second high pressure and high temperature reactor maintained at similar conditions to the first reactor. Oil is withdrawn from the second reactor for further processing as may be desired. Preferably the diluent is a hydrocarbon stream boiling in the range of from 500° to 975° F. and more preferably 600° F. to 800° F. and is mixed with the effluent from the first reactor in the amount of from 20% to 100% by volume of the volume of the effluent.

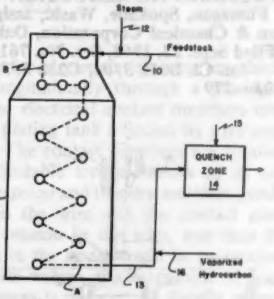
3,579,437
PREPARATION OF HIGH V.I. LUBE OILS
William W. Wentzheimer, Drexel Hill, Pa., Ronald W. Reynolds, Claymont, Del., and William Chalpin, Berwyn, Pa., assignors to Sun Oil Company, Philadelphia, Pa.
Filed Apr. 3, 1969, Ser. No. 813,255
Int. Cl. C10g *13/02*
U.S. Cl. 208—87 **6 Claims**

A process for producing high quality and highly stable lubricating oils with a high viscosity index wherein a lubricating oil fraction is first solvent extracted with a solvent having preferential solubility for aromatics to reduce the polycyclic aromatic content thereof and wherein raffinate from said extraction is hydrocracked under conditions to increase the viscosity index thereof and wherein hydrocracked lubricating oil product is subjected to a second



extraction with a solvent having preferential solubility for aromatics, and including the improvement herein comprising separating the solvent and extract from the lubricating oil raffinate product of said second extraction and employing said solvent with product extract therein for the extraction of hydrocracker charge stock in said first extraction.

3,579,438
THERMAL CRACKING
Carl M. Cruse, Dickinson, Tex., assignor to Monsanto Company, St. Louis, Mo.
Continuation-in-part of application Ser. No. 640,118, May 22, 1967. This application Apr. 20, 1970, Ser. No. 30,252
Int. Cl. C10g *9/14*
U.S. Cl. 208—130 **15 Claims**

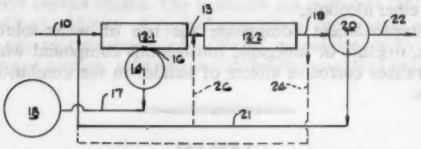


A process for thermally cracking a normally liquid hydrocarbon in a tubular reactor wherein C_4 and higher hydrocarbons are injected prior to the quench zone.

3,579,439
TREATMENT OF SEWAGE
Pieter Gerhard Jacobus Meiring and Peter Hendrik Huisman, Pretoria, Transvaal, Republic of South Africa, assignors to South African Inventions Development Corporation
Filed May 27, 1969, Ser. No. 828,116
Int. Cl. C02c *1/10*
U.S. Cl. 210—5 **9 Claims**

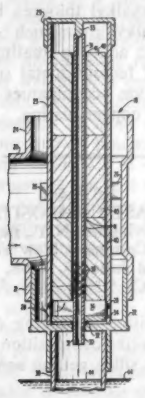
The invention provides for a process of and an apparatus for the treatment of sewage according to the activated sludge process. In this process and apparatus, raw sewage mixed with activated sludge is agitated in an

agitation zone, whereafter a portion of the mixture is directed to a settling zone in which sludge is settled



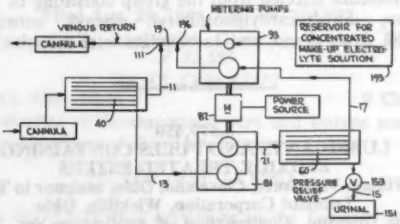
out, and the remainder of the mixture is directed to an aeration.

3,579,440
SEWAGE TREATMENT SYSTEM
William E. Bradley, Jr., Atlanta, Ga., assignor to Tesco Chemicals, Inc., Atlanta, Ga.
Filed Dec. 4, 1969, Ser. No. 882,016
Int. Cl. C02b *3/06*
U.S. Cl. 210—18 **9 Claims**



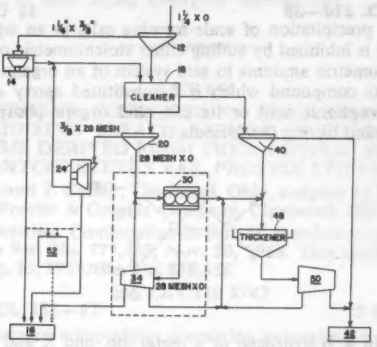
Method and apparatus for treating household waste water wherein raw sewage is decomposed with an aerobic process in a septic tank and chlorine is added to the wastewater after it is discharged from the septic tank.

3,579,441
BLOOD PURIFICATION BY DUAL FILTRATION
Clinton E. Brown, Silver Spring, Md., assignor to Hydronautics, Incorporated, Laurel, Md.
Filed Apr. 19, 1968, Ser. No. 722,727
Int. Cl. B01d *31/00, 13/00*
U.S. Cl. 210—23 **25 Claims**



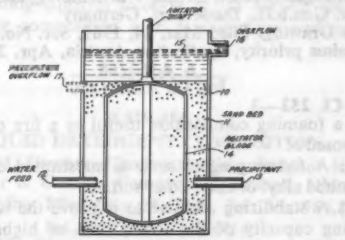
An extra-corporeal device employing filtration means performs the functions of a natural kidney in the following manner: arterial blood is filtered by a highly selective filtration means which retains macromolecular weight blood constituents such as blood cells, fat droplets, high molecular weight polypeptides and high molecular weight lipids, while permitting the passage of water and low molecular weight solutes. The water and solutes are then passed through a second filtration means or combination of filtration and electrodialyzing means which permits only the passage of pure water or pure water and electrolytes. The purified filtrate from this second stage is then combined with a controlled amount of make-up electrolyte solution, and this combined solution is then mixed with the macromolecular weight blood constituents retained by the first filtration means to form the venous return.

3,579,442
COAL CONVERTING PROCESS
Jack N. Gerwig, South Charleston, W. Va., assignor to Bird Machine Company, South Walpole, Mass.
Filed July 9, 1970, Ser. No. 53,508
Int. Cl. B01d *37/04*
U.S. Cl. 210—44 **10 Claims**



A process for converting coal containing refuse to a useable coal product of a predetermined maximum moisture content, comprising the steps of separating wet, refuse-containing coal into fractions according to particle size, including a finest fraction and one or more larger fractions, removing refuse at least from the larger fractions, dewatering the larger fraction to a moisture content below the predetermined maximum, and mechanically dewatering the finest fraction in a continuous centrifuge constructed to provide a finest coal output having a moisture content above the predetermined maximum which, when the fractions are all recombined, will provide a combined moisture content within the predetermined maximum to form said product.

3,579,443
FORMATION OF DENSE PRECIPITATES
Russell J. Horst, 1631 Chippendale Circle, Bethlehem, Pa. 18017
Continuation-in-part of application Ser. No. 749,463, Aug. 1, 1968, This application July 31, 1969, Ser. No. 846,556
Int. Cl. B01d *21/08*
U.S. Cl. 210—49 **24 Claims**

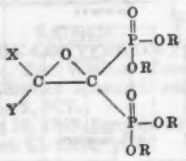


In a process for precipitating dense precipitates from an aqueous solution of iron and mixtures of iron with

other metals, the solution is introduced into a vessel containing a moving bed of a material such as sand in a water medium. Simultaneously, a solid or a liquid precipitant is introduced into the vessel, and the heavy metals, precipitating from the resultant reaction, deposit on the individual particles of the sand bed. The precipitate thus formed is dense and low in retained water. A clean water effluent, substantially free of dissolved heavy metals, is removed from the vessel.

3,579,444
METHODS OF SCALE INHIBITION
Al F. Kerst, Littleton, Colo., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Apr. 13, 1970, Ser. No. 27,983
Int. Cl. C02b *5/06*
U.S. Cl. 210—58 11 Claims

The precipitation of scale-forming salts in an aqueous system is inhibited by adding either stoichiometric or substoichiometric amounts to said system of an organo-phosphorous compound which is a substituted epoxy ethane polyphosphonic acid or its salt, said organo-phosphorus compound having the formula



wherein R is hydrogen or a metal ion, and X and Y are hereinafter defined.

3,579,445
METHOD OF AND COMPOSITION FOR THE TREATMENT OF SCALE
Jack F. Tate, Houston, Tex., assignor to Texaco Inc., New York, N.Y.
No Drawing. Filed June 24, 1968, Ser. No. 739,207
Int. Cl. C02b *5/06*
U.S. Cl. 210—58 7 Claims

Method of and composition for the treatment of scale, particularly calcium sulfate scale, using a quaternary trimethylalkyl ammonium halide, acetate, sulfate or hydroxide containing 8 to 20 carbon atoms in the alkyl group including mixtures.

3,579,446
FIRE-EXTINGUISHING FOAM COMPOSITION INCLUDING A BASIC, NITROGENOUS COMPOUND
Hermann Kroke, Erkrath-Unterbach, and Kurt Raffalsky, Urach, Wurttemberg, Germany, assignors to Minimax Aktiengesellschaft, Urach, Wurttemberg, and Henkel & Cie. G.m.b.H., Dusseldorf, Germany
No Drawing. Filed Mar. 24, 1969, Ser. No. 809,945
Claims priority, application Austria, Apr. 29, 1968, A 4,153/68
Int. Cl. A62d *1/00*
U.S. Cl. 252—3 11 Claims

In a foaming composition useful as a fire extinguisher composed of

(1) A foaming agent such as substituted or unsubstituted alkyl or alkyl-ether sulfate;

(2) A stabilizing additive to improve the water-retaining capacity of the foam, such as higher aliphatic alcohol or ether containing from 8 to 25 carbon atoms, or a higher aliphatic alcohol containing a few alkylene oxide molecules;

(3) Optionally, a compensating agent, which aids in production of foams with reduced weight and of lower discharge velocities, such as monovalent polyether alcohols;

the improvement comprising the use of water-soluble, basic, organic or inorganic nitrogenous compound which neutralizes corrosive effects of halides in the combustion gases.

3,579,447
METHOD OF REMOVING COPPER DEPOSITS FROM FERROUS METAL SURFACES USING HYDROXYALKYL THIOUREA
Thaddeus M. Muzyczko, Melrose Park, William J. Ludwig, Westmont, Jon A. Loboda, Chicago, and Samuel Shore, Roselle, Ill., assignors to The Richardson Company, Melrose Park, Ill.
No Drawing. Filed Sept. 30, 1968, Ser. No. 763,914
Int. Cl. C02b *5/06*; C07c *157/02*; C23g *1/06*
U.S. Cl. 252—8.7 12 Claims

Removal of copper-containing incrustations from ferrous metal surfaces accomplished in improved manner by addition of a hydroxyalkyl thiourea having at least two carbon atoms in the alkyl group such as 1-hydroxyethyl-3-methyl thiourea to an aqueous treating solution and subsequent treatment of ferrous metal surfaces wherein reduced sludge formation accompanies removal of copper and the avoidance of copper plating.

3,579,448
GREASE COMPOSITION
Alvin Harrison, Irvington, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.
No Drawing. Filed June 25, 1968, Ser. No. 739,634
Int. Cl. C10m *7/26*, *7/24*
U.S. Cl. 252—28 5 Claims

A grease composition consisting of a synthetic ester thickened to a grease-like composition with bentonite clay, wherein a pyrogenic silica gelling agent is added thereto.

3,579,449
LUBRICANT COMPOSITION
Robert Earl Wann, Denzel Allan Nicholson, and Ted Joe Logan, Hamilton, Ohio, assignors to the Procter & Gamble Company, Cincinnati, Ohio
No Drawing. Filed Sept. 26, 1968, Ser. No. 762,966
Int. Cl. C10m *1/46*, *1/30*
U.S. Cl. 252—49.5 8 Claims

Lubricant compositions comprising a major amount of a lubricating base fluid and a minor amount of extreme pressure additives which contain either a methylene, monohalomethylene or dihalomethylene group between two moieties selected from the group consisting of phosphono, dihydrocarbylphosphoryl, phenyl, substituted phenyl, keto, cyano, and carboxylate ester moieties.

3,579,450
LUBRICANTS AND FUELS CONTAINING EPOXIDE TREATED ESTERS
William M. Lesuer, Cleveland, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio
No Drawing. Continuation of application Ser. No. 712,606, Mar. 13, 1968, which is a continuation-in-part of applications Ser. No. 567,052, now Patent No. 3,522,179, and Ser. No. 567,320, now Patent No. 3,381,022, both July 22, 1966. This application Oct. 3, 1969, Ser. No. 866,084
Int. Cl. C10m *1/26*
U.S. Cl. 252—56 19 Claims

A process for post-treating oil-soluble esters of mono- or polycarboxylic acids and polyhydric alcohols with or-

ganic epoxides. The acyl moiety of the esters is derived from mono- or polycarboxylic acids containing at least about fifty aliphatic carbon atoms exclusive of the carboxyl carbon atoms. The products are useful as lubricant and fuel additives. A typical example of the process would be the post-treatment of a diester of polyisobutenyl-substituted succinic acid and sorbitol with propylene oxide.

3,579,451

ELECTROPHOTOGRAPHIC DEVELOPER MADE FROM CROSS-LINKED SILICONE INTERMEDIATE RESIN

Louis J. Sciambi, Wenonah, N.J., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of application Ser. No. 582,541, Sept. 28, 1966. This application Jan. 22, 1969, Ser. No. 793,152

Int. Cl. G03g *9/02, 9/04*

U.S. Cl. 252—62.1 **3 Claims**

The method of preparing a stable, dry electrophotographic developer composition concentrate consists essentially of admixing and suspending about one part by weight of a silicone intermediate resin with from about one to five parts by weight of a cross-linking promoting catalyst in an aromatic carrier liquid and heating the admixture at a temperature of from about 50 to 100° C. for a period of about 1 to 24 hours; admixing the heated admixture with from about 0.5 to 4 parts by weight of an insoluble solid pigment per part of resin plus catalyst present (solvent-free basis); milling the resin-catalyst and pigment mixture together in a grinding mill for at least about 8 hours; and evaporating the solvent from the so-milled admixture.

The dry concentrate is made into a liquid concentrate by milling the dry solids for from about 8 to 24 hours with sufficient organic carrier liquid, such as a liquid aliphatic hydrocarbon, to provide a suitable grinding slurry viscosity. This milled liquid concentrate is diluted further with carrier liquid to provide the proper concentration of catalyst per liter of composition as well as an electrical conductivity within the desired range and the so-diluted mixture is a working electrophotographic developer composition.

3,579,452

PROCESS FOR THE PRODUCTION OF FERROMAGNETIC PURE OR ISOTYPE MANGANATE MIXED PHASES CRYSTALLIZING IN THE ILMENITE LATTICE

Franz Hund, Krefeld-Bockum, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 28, 1968, Ser. No. 755,937

Claims priority, application Germany, Sept. 1, 1967, F 53,389

Int. Cl. C01g *45/12*

U.S. Cl. 252—62.51 **9 Claims**

Production of ferromagnetic pure and isotype manganate mixed phases of the composition

$$Ni_{1-x}Co_x \cdot 0.91\text{–}1.1\ MnO_3;$$

where $0 \leqq x \leqq 0.20$ that crystallize in the ilmenite lattice, by precipitating such mixed phase constituens from an aqueous salt solution of manganese and nickel, or manganese, nickel and cobalt, ions, in quantitative proportions which correspond directly to those of the required end compound, by instantly intermixing such reactants with a basic precipitant at about 0–100° C., oxidizing the resulting suspension, and then filtering, washing, calcining and cooling the resulting precipitate.

3,579,453

ALKALI-SOLUBLE SURFACTANT CONSISTING OF SUBSTITUTED SUCCINIC ACID-NONIONIC ETHOXYLATE BLENDS

Jean Dupre, Levittown, and Harrison Scott Killam, Holland, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

No Drawing. Filed Nov. 12, 1968, Ser. No. 775,137

Int. Cl. C11d *1/66*

U.S. Cl. 252—89 **8 Claims**

Nonionic ethoxylated surfactants, which are known to be very desirable components in heavy duty cleaning products, suffer from the fact that they have limited solubility in solutions of alkaline electrolytes and thus are not soluble in alkaline builder concentrates. Addition of moderate amounts of substituted succinic acids overcomes this defect and permits the inclusion of these nonionics in built liquid detergent concentrates.

3,579,454

DETERGENT COMPOSITIONS CONTAINING AN OXIDIZING BLEACH AND PROTEOLYTIC ENZYME DERIVED FROM THERMOPHILIC *STREPTOMYCES RECTUS* VAR. *PROTEOLYTICUS*

Everett J. Collier, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Continuation-in-part of abandoned application Ser. No. 777,485, Nov. 20, 1968. This application Aug. 15, 1969, Ser. No. 850,656

Int. Cl. C11d *9/42*

U.S. Cl. 252—97 **7 Claims**

Detergent composition containing an organic synthetic detergent and an alkaline builder in a weight ratio of about 1:30 to about 5:1, an oxidizing bleach and a proteolytic enzyme derived from thermophilic *Streptomyces rectus* var. *proteolyticus* ATCC 21067. These compositions are useful in any application where the combined effect of an oxidizing bleach and proteolytic enzyme activity are desired, such as laundering and soaking compositions.

3,579,455

MACHINE DISHWASHING COMPOSITIONS CONTAINING SODIUM POLYACRYLATE

Philip M. Sabatelli, Cincinnati, Ohio, and Charles A. Brungs, Covington, Ky., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Filed Aug. 2, 1968, Ser. No. 749,592

Int. Cl. C11d *7/14, 7/16, 7/26*

U.S. Cl. 252—135 **5 Claims**

A machine dishwashing composition is disclosed which includes alkali metal carbonate, a tetra-alkali metal pyrophosphate, an alkali metal hexametaphosphate, a water-soluble salt of polyacrylic acid, and an alkali metal metasilicate. Cooking and eating utensils may be cleaned by a low foaming aqueous solution of the present machine dishwashing composition with less spotting and greater clarity.

3,579,456

LIQUID DETERGENT COMPOSITION

Cushman M. Cambre, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed Dec. 18, 1968, Ser. No. 784,886

Int. Cl. C11d *3/08, 3/14*

U.S. Cl. 252—137 **6 Claims**

Stable, liquid detergent compositions (for cleaning aluminum and rust stains from hard surfaces) containing

particulate materials (e.g., abrasives), water, alkylbenzenesulfonate detergent, zwitterionic synthetic detergent and an acid electrolyte; said compositions have a pH of from about 1 to about 5.

3,579,457

EPOXIDE TAURINE CONDENSATION PRODUCTS AND DETERGENT COMPOSITIONS CONTAINING THEM

Robert M. Lincoln, Moylan, and Joseph A. Meyers III, Springfield, Pa., and Richard W. Sauer, Cherry Hill, N.J., assignors to Atlantic Richfield Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 625,281, Mar. 23, 1967, which is a continuation-in-part of application Ser. No. 548,876, May 10, 1966. This application Apr. 2, 1969, Ser. No. 812,919

Int. Cl. C11d *3/34*

U.S. Cl. 252—137 3 Claims

Novel condensation products wherein a C_3–C_5 aliphatic epoxide and a C_5–C_{18} aliphatic epoxide are condensed with taurine, and built synthetic detergent compositions wherein at least a portion of the sodium tripolyphosphate is replaced by this epoxide-taurine condensation product.

3,579,458

COMPOSITION OF MATTER

Joseph E. Callen and Robert D. Haxby, Springfield Township, Hamilton County, and William T. Fagin, Colerain Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Continuation-in-part of application Ser. No. 517,941, Jan. 3, 1966. This application May 8, 1968, Ser. No. 727,654

Int. Cl. C11d *3/42*

U.S. Cl. 252—152 8 Claims

A composition consisting essentially of certain relatively water insoluble brighteners essentially completely dissolved in an acidic solvent which forms a detergent when it is neutralized; processes for preparing said composition; and the corresponding neutralized composition.

3,579,459

METAL VAPOR GENERATING COMPOSITIONS

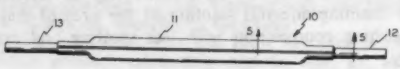
Paolo Della Porta and Elio Rabusin, Milan, Italy, assignors to S.A.E.S. Getters S.p.A., Milan, Italy

Filed Dec. 13, 1967, Ser. No. 690,125

Claims priority, application Italy, Dec. 13, 1966, 31,040/66; Oct. 12, 1967, 21,538/67

Int. Cl. C09k *3/00;* H01v *39/22*

U.S. Cl. 252—181.4 24 Claims



(A) an open sitered matrix of a sinterizable material in a vacuum releases a metal vapor. The structure comprises

(A) an open sintered matrix of sinterizable material and,

(B) a mixture, fixedly held within the sintered matrix, said mixture comprising:

(1) a compound of a metal selected from the group consisting of mercury and the alkali metals said compound being reducible to its metal, and,

(2) a stoichiometric excess of a reducing agent for said compound.

Devices employing these composite structures and processes for producing these structures.

3,579,460

SULFENAMIDE COMPOSITIONS STABILIZED BY ORGANIC DISULFIDES

Joseph Edward Kerwood, 2886 Burr Oak Drive, Akron, Ohio 44313

No Drawing. Filed June 16, 1969, Ser. No. 833,736

Int. Cl. C08d *11/02*

U.S. Cl. 252—182 15 Claims

A composition comprising a thiazolesulfenamide accelerator and a sulfenamide prevulcanization inhibitor can be stabilized by the addition of an organic disulfide of the formula T—S—S—T wherein T independently is lower alkyl, aralkyl, aryl, alkenyl or a 2-thiazolyl radical.

3,579,461

EMULSIFICATION PROCESS

Wayne R. Glaub, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Nov. 20, 1967, Ser. No. 684,436

Int. Cl. B01j *13/00*

U.S. Cl. 252—311 9 Claims

An improved process for manufacturing a wax emulsion under pressure is described According to the process, the wax and a minor amount of the total water used in the emulsion are added to the pressure vessel and heated under pressure. An emulsifier is added, preferably beneath the surface of the wax/water concentrate, with agitation to obtain uniformity and provide a water-in-wax emulsion. The emulsion is diluted rapidly with sufficient water being added beneath the surface to obtain a wax-in-water emulsion.

3,579,462

TREATMENT OF SILICA SOLS

Henry Thomas Joseph Chilton and Patricia Gertrude Burns, Llangollen, Denbighshire, Wales, assignors to Monsanto Chemicals Limited, London, England

No Drawing. Filed Sept. 6, 1968, Ser. No. 758,116

Claims priority, application Great Britain, Sept. 12, 1967, 41,593/67

Int. Cl. B01j *13/00;* C01b *33/14*

U.S. Cl. 252—313S 14 Claims

A process for the isolation, from an initial silica sol having a relatively wide range of particle sizes, of one or more fractions in each of which the particle size of the silica is relatively uniform, which comprises placing the initial silica sol on a permeable bed of a porous gel, which gel comprises a solid phase substantially insoluble in the liquid dispersion medium of the silica sol, and a liquid phase which is the same as or is compatible with the liquid dispersion medium, the gel having an average pore size comparable with the average particle size of the silica, washing the silica through the bed with an eluant which is the same as or compatible with the liquid dispersion medium of the initial sol and with the liquid phase of the gel and collecting as an effluent from the bed at least one fraction of colloidally dispersed silica in which the range of particle size is less than that in the initial silica sol.

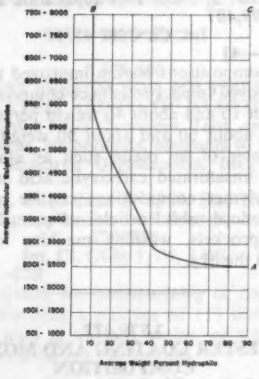
3,579,463
METHOD OF PREPARING CRYSTALLINE CALCIUM HALOPHOSPHATE PHOSPHOR
Anselm Wachtel, Parlin, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed May 7, 1969, Ser. No. 822,501
Int. Cl. C09k *1/36*
U.S. Cl. 252—301.4 8 Claims

Method of preparing crystalline calcium halophosphate of a particle size distribution which can be advantageously used in commercial fluorescent lamps. A raw mix is prepared of the constituents required to form the calcium halophosphate matrix with an excess of calcium and halogen constituents in predetermined amounts. The firing is carried out at a predetermined temperature and time to form the halophosphate matrix having the desired crystallinity and particle size distribution. Then, a selected amount of activator constituent is mixed with the halophosphate matrix and is incorporated into the matrix during a subsequent firing to form the phosphor.

3,579,464
NONDECREPITATING SILICA GEL AND METHOD FOR ITS PREPARATION
Harvey Rosen, Laurel, and Ellsworth G. Acker and Hanju Lee, Baltimore, Md., assignors to W. R. Grace & Co., New York, N.Y.
No Drawing. Filed May 20, 1968, Ser. No. 730,620
Int. Cl. B01j *13/00;* C01b *33/16;* C09k *3/00*
U.S. Cl. 252—317 10 Claims

Conventional partially dried silica hydrogel particles having about 2–20% moisture content are ground to about 1–500 microns. This powder is then blended with silica hydrosol solution in proportions such that the weight ratio of silica from the hydrogel particles to silica in the hydrosol is about 15:11. The resultant mixture is then extruded, beaded, pelleted or otherwise shaped. The thus shaped products are then aged, washed, dried and activated.

3,579,465
AQUEOUS GELS OF POLYOXYETHYLATED POLYOXYPROPYLENE GLYCOL ADDUCTS OF ETHYLENE DIAMINE
Irving R. Schmolka, Grosse Ile, Mich., assignor to Wyandotte Chemicals Corporation, Wyandotte, Mich.
Filed Oct. 16, 1967, Ser. No. 675,505
Int. Cl. A01n *9/00;* A61k *7/00;* B01j *13/00*
U.S. Cl. 252—316 6 Claims



Aqueous gels, useful in the formulation of pharmaceutical, cosmetic and detergent compositions, are prepared from certain polyoxyethylated polyoxypropylene glycol adducts of ethylene diamine.

3,579,466
POLYGLYCIDYL POLYMERS AS DEMULSIFIERS
Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, Wilmington, Del.
No Drawing. Original application Mar. 8, 1965, Ser. No. 438,115. Divided and this application Jan. 17, 1969, Ser. No. 792,157
Int. Cl. B01d *17/04*
U.S. Cl. 252—331 14 Claims

A process of demulsification which employs polyglycidyl polymers and copolymers thereof and derivatives thereof as demulsifiers.

3,579,467
ORGANOPOLYSILOXANES HAVING HYDROXYARYL SUBSTITUENTS
Edgar D. Brown, Jr., Schenectady, N.Y., assignor to General Electric Company
No Drawing. Continuation-in-part of application Ser. No. 600,787, Dec. 12, 1966. This application Nov. 27, 1968, Ser. No. 779,622
Int. Cl. C10m *1/50*
U.S. Cl. 252—46.3 11 Claims

Organopolysiloxanes useful as hydraulic fluids comprise organopolysiloxanes in which a majority of the siloxane groups contain methyl radicals and higher alkyl radicals, and a minor proportion of the siloxane groups contain silicon-bonded tertiary butyl-substituted hydroxyaryl radicals attached to silicon through a divalent propylene radical. Optionally, a minor amount of aryl and aralkyl radicals can also be present on the siloxane groups. These compounds are prepared by reacting polysiloxanes containing methylhydrogen units and phenylhydrogen units with higher alkenes and hydroxyaryl compounds containing both nuclear substituted allyl radicals and nuclear substituted tertiary butyl radicals.

3,579,468
PROCESS FOR RECONSTITUTING NATURAL CITRONELLA OIL
Robert P. T. Young, Ponte Vedra, Fla., assignor to SCM Corporation, New York, N.Y.
No Drawing. Filed Aug. 26, 1966, Ser. No. 575,238
Int. Cl. C11b *9/00, 9/02*
U.S. Cl. 252—522 1 Claim

Reconstituted citronella oil in which at least a portion of the naturally occurring d-citronellal in the natural oil is replaced by substantially equivalent weight proportion of dl-citronellal is described. The reconstituted citronella oil has substantially the same odor value as that of the natural citronella oil. Processes for preparing this product are also described. The invention is advantageous in that it provides d-citronellal which would not otherwise be available and which is useful in making hydroxy citronellal, a perfumery chemical and is also advantageous in that it extends the supply of citronella oil.

3,579,469
SILOXANE PAPER RELEASE COATINGS
Maurice E. Grenoble, Ballston Lake, N.Y., assignor to General Electric Company
No Drawing. Filed Dec. 13, 1968, Ser. No. 783,773
Int. Cl. C08k *1/66*
U.S. Cl. 260—18 5 Claims

A paper release coating composition contains a silanol-terminated polysiloxane gum, a silane of the formula $HSiX_3$, where X is a hydrolyzable radical, a metal salt and an organic solvent. A surface of a sheet of paper is coated with the composition, the solvent is evaporated, and the silanol-terminated polysiloxane is cross-linked by reaction with the silane in the presence of moisture at an elevated temperature. The coated paper produced is useful as a backing sheet for bumper stickers.

3,579,470

DIPHENYL OXIDE MODIFIED PHENOLIC RESIN INSULATING VARNISHES

Robert H. Runk, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

No Drawing. Continuation of applications Ser. No. 394,312, Sept. 5, 1964, and Ser. No. 706,706, Feb. 19, 1968. This application Dec. 30, 1968, Ser. No. 800,313

Int. Cl. C08g *37/20*

U.S. Cl. 260—20 14 Claims

Monomeric monofunctional chloromethyl diphenyl oxide and/or alkoxy methyl diphenyl oxide is reacted with a substantially equimolar amount of a phenol. The product is further reacted with formaldehyde to form a resole that that may be converted to a cross-linked polymer by the application of heat. The resole resins may be blended with modifying compositions such as epoxy esters and/or oil modified alkyds and the like.

3,579,471

CELL MODIFYING AGENTS FOR POLYURETHANE FOAMS

Willem Dijkhuizen, Harmannus Kliphuis, and Jan Lolkema, Hoogezand, Netherlands, assignors to Scholten Research N.V., Groningen, Netherlands

No Drawing. Filed Oct. 18, 1967, Ser. No. 676,085

Claims priority, application Great Britain, Oct. 22, 1966, 47,454/66

Int. Cl. S08g *22/44, 53/08*

U.S. Cl. 260—2.5 21 Claims

Polyurethane foams having improved physical properties are provided herein by producing the foams in the presence of cell modifying agents, at least one of which is an organic high molecular weight emulsifying agent substantially soluble in mineral oil but substantially insoluble in water, and which emulsifying agent is capable of producing heat-stable water-in-oil emulsions. The emulsifying properties of these new cell modifying agents are such that upon subjecting 20 $cm.^3$ of 0.5% solution of said emulsifying agent in a mineral oil of a viscosity of 1–5° Engler at 20° C. to the A.S.T.M. "Steam Emulsion Test"; the time for separating 5 $cm.^3$ of one of the phases of the emulsion at a temperature of 93° C. to 95° C. is at least 20 minutes.

3,579,472

METHOD OF FABRICATING EXPANDABLE THERMO-PLASTIC RESINOUS MATERIAL

Louis C. Rubens and William B. Walsh, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of application Ser. No. 526,358, Feb. 10, 1966, which is a continuation-in-part of application Ser. No. 439,969, Mar. 15, 1965. This application May 31, 1968, Ser. No. 733,231

Int. Cl. C08f *1/16, 7/06, 47/10*

U.S. Cl. 260—2.5 8 Claims

Replicating foam plastic bodies are prepared by polymerization at room temperature of chlorostyrene, methyl methacrylate, a cross-linking agent and a blowing agent, without requiring a closed mold or vessel.

3,579,473

EPOXY SOLDERS

George A. Salensky, Metuchen, N.J., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Dec. 27, 1968, Ser. No. 787,555

The portion of the term of the patent subsequent to June 10, 1986, has been disclaimed

Int. Cl. C09g *51/06, 51/04, 31/12*

U.S. Cl. 260—18 13 Claims

This invention relates to epoxy solders, containing a talc of specified properties, which are characterized by excellent thermal shock resistance, and cure speed and adhesion to oil contaminated surfaces.

3,579,474

ELASTOMERIC COPLYMERS OF TETRAFLUOROETHYLENE CONTAINING PHENOXYETHYL GROUPS, AND THEIR VULCANIZATION

Rolland S. Ro, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Dec. 16, 1968, Ser. No. 784,234

Int. Cl. C08f *19/04, 45/24*

U.S. Cl. 260—29.6 10 Claims

Novel elastomeric copolymers of tetrafluoroethylene with (1) (a) an alkyl vinyl ether, or either (b) an olefin which is from 50 to 100 mole percent of propylene, butene-1 or a mixture of them, any remainder being ethylene or isobutylene, or (c) ethylene and isobutylene in about equimolar proportions, and (2) 0.5 to 5 percent by weight of the product of a cure-site monomer which is an aryloxyalkyl vinyl ether, are made by catalytically uniting the components in an inert medium. The copolymer products are cleanly, quickly and efficiently cured by mixing with small amounts of polyformaldehyde or methylol-containing condensation products of formaldehyde with urea, phenol, or melamine under nonbasic, preferably acidic, conditions to form novel elastomeric products having improved elastic properties.

3,579,475

CROSS-LINKED POLY(ARYLSULPHONE ETHERS)

Michael Edward Benet Jones, 45 Richmond Crescent, Vicars Cross, Chester, England, and Brian Edmund Jennings, Cherry Acre, 40 Harmer Green Lane, Digswell, Welwyn, Hertfordshire, England

No Drawing. Continuation of application Ser. No. 755,492, Aug. 7, 1968. This application Feb. 17, 1970, Ser. No. 12,141

Int. Cl. C08g *25/00*

U.S. Cl. 260—37 9 Claims

A thermoplastic polymer containing aromatic residues in the polymer chain is cross-linked by heating with an aromatic compound containing at least two sulphonyl chloride, bromide, hydrazide or ester groups. The thermoplastic polymer may itself contain at least two of these reactive sulphonyl groups per chain and can be cross-linked on heating alone.

3,579,476

GLASS FILLED GRAFT COPOLYMERS OF AN OLEFIN AND AN UNSATURATED ACID

James K. Rieke and Frank H. Justin, Midland, Mich., assignors to Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of application Ser. No. 531,381, Mar. 3, 1966. This application Feb. 14, 1969, Ser. No. 799,487

Int. Cl. C08f *45/10*

U.S. Cl. 260—41 11 Claims

Polymer compositions having improved tensile properties and improved impact resistance comprising a blend of between about 10 and about 40 weight percent glass fibers and between about 60 and about 90 weight percent of a graft copolymer of an olefin such as ethylene and an ethylenically unsaturated carboxylic acid such as acrylic acid. The polymer compositions can be molded or extruded to produce useful articles of manufacture including gears, sprockets, washing machine agitators, gear housings, and the like.

3,579,477

POLYESTER COATING AND MOLDING COMPOSITION

Samuel P. Vess, Marfa, Tex., assignor to Decor Dimensionals, Inc., Greenville, Tex.

No Drawing. Filed Sept. 3, 1968, Ser. No. 757,104

Int. Cl. C08k *1/02*

U.S. Cl. 260—40 29 Claims

A composition and method for forming semi-flexible and rigid polyester articles and coatings which are vapor-

permeable and liquid impervious. The compositions comprise mixtures of polyesters, expanded mineral fillers and a monomeric polymerizable solvent.

3,579,478
POLYOLEFIN STABILIZATION
Howard E. Dunn and Ronald D. Mathis, Bartlesville, Okla., assignors to Phillips Petroleum Company
No Drawing. Filed Jan. 6, 1969, Ser. No. 789,384
Int. Cl. C08f 45/62
U.S. Cl. 260—45.75 7 Claims

Minor amounts of nickel complexes of the type

$$(R_2NCH_2CH_2S)_2Ni$$

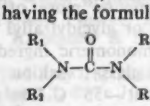
wherein R is hydrogen or a hydrocarbon radical, are incorporated into solid homopolymers or copolymers derived from olefins having from 2 to 6 carbon atoms per molecule for protection against the deteriorating effects of ultraviolet light.

3,579,479
3-ENDO-METHYL - 3 - EXO(4' - METHYL - 5'-HYDROXYPENTYL)NORCAMPHOR AND 2-METHYL-5-BROMOPENTANOL, AND PROCESS FOR THE PREPARATION OF THESE COMPOUNDS
Wayne I. Fanta and William F. Erman, Springfield Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
No Drawing. Filed Mar. 29, 1968, Ser. No. 717,360
Int. Cl. C07c 49/27
U.S. Cl. 260—586 12 Claims

The novel compounds, 2-methyl-5-bromopentanol and 3-endo-methyl-3-exo(4' - methyl - 5' - hydroxypentyl) norcamphor and the process for preparing 2-methyl-5-bromopentanol and 3 - endo-methyl-3-exo(4'-methyl-5'-hydroxypentyl)norcamphor from 2 - methyl-4-pentenol comprising the steps of (1) borating 2-methyl-4-pentenol with boric acid and/or boric anhydride to obtain tri (2-methyl-4-pentenyl)borate; (2) hydrobrominating the tri(2-methyl-4-pentenyl)borate in the presence of a free radical catalyst and, subsequently, hydrolyzing the reaction product to obtain 2-methyl-5-bromopentanol; (3) borating the 2-methyl-5-bromopentanol with boric acid and/or boric anhydride to obtain tri(2-methyl-5-bromopentyl)borate; (4) alkylating 3 - methylnorcamphor with the tri(2-methyl-5-bromopentyl)borate and, subsequently, hydrolyzing the reaction product to obtain 3-endo-methyl-3-exo(4'-methyl-5'-hydroxypentyl)norcamphor.

3,579,480
CATALYST SYSTEM FOR POLYMERIZING SATURATED, ALIPHATIC ALDEHYDES
Henricus Gerardus Josef Overmars, Zeist, and Jan Gerrit Noltes, Utrecht, Netherlands, assignors to International Lead Zinc Research Organization, Inc., New York, N.Y.
No Drawing. Filed June 5, 1968, Ser. No. 734,577
Claims priority, application Netherlands, June 20, 1967, 6708558
Int. Cl. C08g 1/06, 1/08
U.S. Cl. 260—67R 11 Claims

A catalyst system for polymerizing or copolymerizing aldehydes, comprising a mixture of (1) dialkylzinc, (2) a co-catalyst, such as alcohol, amine, or water, and (3) a stabilizing agent having the formula



wherein each R represents hydrogen, alkyl, cycloalkyl, aralkyl, or aryl radicals, and when R_1, R_2, and R_3=hydrogen, R_4 contains at least three carbon atoms.

3,579,481
CATALYST SYSTEM FOR POLYMERIZING SATURATED, ALIPHATIC ALDEHYDES
Henricus Gerardus Josef Overmars, Zeist, and Jan Gerrit Noltes, Utrecht, Netherlands, assignors to International Lead Zinc Research Organization, Inc., New York, N.Y.
No Drawing. Filed June 5, 1968, Ser. No. 734,576
Claims priority, application Netherlands, June 20, 1967, 6708558
Int. Cl. C08g 1/06, 1/08
U.S. Cl. 260—67R 12 Claims

A catalyst system for polymerizing or copolymerizing aldehydes, comprising a mixture of (1) dialkylzinc, (2) a co-catalyst, such as alcohol, amine, or water, and (3) a stabilizing agent having the formula Aryl—NR—CO—R' wherein R represents hydrogen, alkyl, cycloalkyl, or aryl radicals, and R' represents alkyl, aryl, alkoxy, aryloxy or carbamate radicals.

3,579,482
POLYMERS OF OLEFINICALLY UNSATURATED DIISOCYANATES (III)
Thomas K. Brotherton and John W. Lynn, Charleston, W. Va., assignors to Union Carbide Corporation
Division of application Ser. No. 409,921, Nov. 9, 1964, now Patent No. 3,427,346, which is a continuation-in-part of application Ser. No. 212,480, July 25, 1962. This application Apr. 2, 1968, Ser. No. 718,080
Int. Cl. C08g 22/18
U.S. Cl. 260—77.5 14 Claims

Polyisocyanato-containing polymers obtained via the vinyl polymerization of unsaturated diester diisocyanates as exemplified by bis(2-isocyanatoethyl) fumarate with/without ethylenically unsaturated compounds, e.g., styrene, vinyl acetate, etc., which have utility in the manufacture of foamed products, coatings, reinforced plastic materials, and other areas.

3,579,483
ε-CAPROLACTAM CONTINUOUS POLYMERIZATION PROCESS
Ian C. Twilley, Chester, and William N. Russell and Weldon H. Peterson, Colonial Heights, Va., assignors to Allied Chemical Corporation, New York, N.Y.
Filed Apr. 15, 1969, Ser. No. 816,286
Int. Cl. C08g 20/14, 20/42
U.S. Cl. 260—78 11 Claims

Apparatus and process for continuous polymerization of polyamides to produce a polymer wherein the required viscosity can be obtained much more rapidly and the extent of polymerization far greater than heretofore possible by use of a vacuum demoisturizing column within the polymerization train wherein the pre-polymer is converted to polyamide of higher molecular weight in a short period of time by exposing at least about 0.2 square foot of pre-polymer per pound thereof to a temperature of between about 230° C. and about 300° C. at pressures of less than about 500 mm. Hg. The apparatus and process yields even greater efficiencies when used in conjunction with polyamidation catalysts.

3,579,484
COMPOUNDING AIDS FOR THERMOSETTING ALLYLIC RESIN MOLDING COMPOUNDS
James Larue Thomas, Baltimore, Md., assignor to FMC Corporation, New York, N.Y.
Filed Mar. 18, 1968, Ser. No. 713,675
Int. Cl. C08f 3/60, 45/04
U.S. Cl. 260—78.4 8 Claims

The compounding characteristics of thermosetting allylic resin molding compounds are improved by the addition of 1 to 100 parts per million, by weight based on resin,

of a metal, in chemically combined form, selected from the group consisting of magnesium, potassium, calcium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, zinc, zirconium, molybdenum, antimony, tungsten, lead and cerium.

Addition of an effective amount of these selected metals causes a substantial improvement in compounding performance in terms of controllable uniform rate of viscosity increase during compounding and elimination of sticking to compoundng equipment without substantially altering the properties of the molding compound or the final molded product.

3,579,485

CHLORINATED CARBOXYL GROUP CONTAINING POLY-α-OLEFINS

Paul D. Folzenlogen, Windell C. Watkins, and Hugh J. Hagemeyer, Jr., Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Feb. 7, 1969, Ser. No. 797,700
Int. Cl. C08f *3/02, 3/04, 3/08*
U.S. Cl. 260—78.4D **19 Claims**

This invention relates to chlorinated carboxyl group containing poly-α-olefins which can be prepared by chlorinating a carboxyl group containing poly-α-olefin. These chlorinated poly-α-olefins form primer coatings for use on untreated poly-α-olefin substrates, which can be decorated by printing or painting.

3,579,486

MALEATED POLYOLEFINS

Richard L. McConnell and Frederick B. Joyner, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Dec. 22, 1967, Ser. No. 692,703
Int. Cl. C08f *15/04, 27/04, 27/08*
U.S. Cl. 260—78.4 **7 Claims**

Normally available maleated polyolefins are improved by treating with a base to neutralize residues in the nature of maleic or fumaric acid; such bases include organic amines, metal hydroxides or metal alkoxides. The improved products have greater adhesion to paper, leather, fabrics, metal foils and other substrates, are generally free of toxic constituents and produce improved stereographic sheets and other coated objects.

3,579,487

POLYANHYDRIDE-MONOEPOXIDE COMPOSITIONS CONTAINING A MONOANHYDRIDE

Stanley M. Hazen, Cheswick, and William J. Heilman, Allison Park, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Oct. 19, 1967, Ser. No. 676,408
Int. Cl. C08f *15/00*
U.S. Cl. 260—78.5T **7 Claims**

Liquid coating and molding compositions are provided which are curable to an infusible resin article or coating. The composition comprises a solution of a saturated or unsaturated monooxirane compound, for example epichlorohydrin, a monoanhydride of a dicarboxylic acid containing at least 5 carbon atoms, such as phthalic anhydride and a solid polyanhydride having succinic anhydride groups (excluding aromatic anhydrides in which the α-carbon atoms of the anhydride group are included in the aromatic ring) for example the copolymer of a straight chain α-monoolefin and a maleic anhydride. Preferably a tertiary amine, such as 3-picoline, is included as a cure accelerator. The composition shows little or no shrinkage and weight loss during curing, in contrast to the same composition minus the mono-anhydride. Thus for example, films and coatings free of lifting and etching are obtained.

3,579,488

WATER-SOLUBLE COPOLYMERS OF ALKYLENIMINE AND ALKYLENE SULFIDE

Giffin D. Jones and Nancy B. Tefertiller, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Jan. 16, 1969, Ser. No. 791,806
Int. Cl. C08g *25/00*
U.S. Cl. 260—79 **6 Claims**

Water-soluble copolymers of a C_2–C_4 alkylenimine and a C_3–C_4 alkylene sulfide are obtained by an acid catalyzed copolymerization using as a catalyst about 3–15 mole percent based on total monomer of a strong water-soluble organic acid, preferably an aromatic sulfonic acid. The resulting water-soluble copolymers, having an average molecular weight of about 5–50 thousand contain about 10–40 mole percent copolymerized alkylene sulfide and are effective dispersants and dewatering agents in sewage treatment and also have flocculant activity.

3,579,489

POLYMERIZATION OF BETA-LACTONES

Willem M. Wagner, Amsterdam, Netherlands, assignor to Shell Oil Company, New York, N.Y.

No Drawing. Filed Dec. 20, 1968, Ser. No. 785,795
Claims priority, application Great Britain, July 1, 1968, 31,239/68
Int. Cl. C08g *17/02*
U.S. Cl. 260—78.3 **12 Claims**

The molecular weight distribution and heat stability of polylactones, particularly poly(beta-lactones), are controlled by polymerizing the lactones in the presence of an ionic initiator and certain chain-transfer agents such as alpha-halo-ketones and alpha-halo-aldehydes.

3,579,490

METHOD OF PRODUCING RESINS FOR USE IN ADHESIVES

Stanley Kordzinski, deceased, late of Old Bridge, N.J., by Eileen Kordzinski, executrix, Old Bridge, and Milton B. Horn, Plainfield, N.J., assignors to Ashland Oil & Refining Company, Ashland, Ky.

No Drawing. Continuation-in-part of abandoned application Ser. No. 20,822, Apr. 8, 1960. This application Aug. 31, 1964, Ser. No. 393,433
Int. Cl. C08f *15/14, 15/18, 15/20*
U.S. Cl. 260—80.72 **11 Claims**

A tacky and pressure sensitive adhesive comprising one or more aliphatic esters of acrylic, methacrylic and acetic acid together with one or more of glycidyl acrylate, glycidyl methacrylate or glycidyl allyl ether is disclosed. The proportions of monomeric ingredients are selected to give a calculated glass transition temperature from about −20° C. to about −55° C. The monomeric system is copolymerized at a temperature not exceeding about 100° C. in order to keep the glycidyl compounds intact during polymerization.

3,579,491

METHOD FOR PREPARING POLYMERS AND COPOLYMERS OF VINYL CHLORIDE BY BULK POLYMERIZATION AT LOW TEMPERATURE AND PRODUCTS THEREOF

Marc E. Carrega, Chatenay-Malaby, France, assignor to Produits Chimiques Pechiney-Saint-Gobain, Neuilly-sur-Seine, France

No Drawing. Filed Jan. 30, 1969, Ser. No. 795,347
Claims priority, application France, Feb. 7, 1968, 139,017
Int. Cl. C08f *3/30, 15/06*
U.S. Cl. 260—85.5 11 Claims

The polymerization and copolymerization of vinyl chloride in bulk, in the absence of oxygen and at a temperature within the range of —100° to 20° C. in the presence of a catalytic system comprising an alpha-halogenated diacyl peroxide and an organo aluminum compound.

3,579,492

METHOD FOR PREPARING LONG CHAIN ALKYL COMPOUNDS

William Novis Smith, Jr., Exton, Pa., assignor to Foote Mineral Company, Exton, Pa.

No Drawing. Filed Apr. 18, 1968, Ser. No. 722,179
Int. Cl. C08f *1/76, 3/06*
U.S. Cl. 260—94.9 10 Claims

Ethylene is polymerized in a solution of an n-butyllithium: N,N,N',N'-tetramethylethylene diamine complex under temperature and pressure conditions selected from a narrow range of each until substantially all of the resulting polymer has precipitated from the solution as a long chain n-alkyllithium compound which may be converted to the corresponding polyethylene having a molecular weight from about 1500 to about 4000 with a Mw/Mn ratio of about 1.

3,579,493

POLYMERIZATION OF ETHYLENE USING REDUCED GROUPS IV–B, V–B AND VI–B METAL SALTS AS THE POLYMERIZATION CATALYST

Karl Ziegler, 1 Kaiser Wilhelm Platz, Muelheim (Ruhr), Germany, and Heinz Breil, Muelheim (Ruhr), Germany; said Breil assignor to said Ziegler

No Drawing. Filed Aug. 9, 1955, Ser. No. 527,412
Claims priority, application Germany, Aug. 13, 1954, Z 4,371; Aug. 14, 1954, Z 4,374
Int. Cl. C08d *3/04, 3/08*
U.S. Cl. 260—94.9 13 Claims

The polymerization of ethylene utlizing a catalyst formed by reducing a halide or acetylacetonate of a metal of Groups IV–B, V–B and VI–B of the periodic chart of the elements, including thorium and uranium, with an alkali metal or magnesium, or a mixture or an alloy thereof, or sodium-, lithium- or calcium hydride. The reduction agent may be in the form of a complex, as for example a complex compound with an organo boron compound. The catalyst may also be admixed with table salt.

3,579,494

C-SULFONATED TYROSYL PEPTIDES RELATED TO CHOLECYSTOKININ-PANCREOZYMIN (CCK-PZ)

Miguel A. Ondetti, North Brunswick, John T. Sheehan, Middlesex, and Josip Pluscec, East Brunswick, N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Filed July 18, 1968, Ser. No. 745,688
Int. Cl. C07c *103/52*
U.S. Cl. 260—112.5 7 Claims

Novel peptide amides of the general formula

R—Met—Gly—Trp—Met—Asp—Phe—NH_2

wherein R represents L-aspartyl-3'-sulfonyl-L-tyrosyl, L-aspartyl - L - arginyl - L - aspartyl-3'-sulfonyl-L-tyrosyl, or isoleucyl - L - seryl-L-aspartyl-L-arginyl-L-aspartyl-3'-sulfonyl-L-tyrosyl, and intermediates in the production thereof. The peptide amides of this invention as well as the pharmaceutically acceptable salts thereof have been found to possess cholecystokinin activity.

3,579,495

ISOLATION OF ORGOTEIN FROM BLOOD

Wolfgang Huber, San Francisco, Calif., assignor to Diagnostic Data, Inc., Palo Alto, Calif.

No Drawing. Continuation-in-part of application Ser. No. 815,175, Apr. 10, 1969, which is a continuation-in-part of application Ser. No. 728,777, May 13, 1968. This application Apr. 24, 1970, Ser. No. 31,791
Int. Cl. A61k *17/00;* C07g *7/04*
U.S. Cl. 260—115 5 Claims

Orgotein is isolated from lysed plasma-free erythrocytes by a series of steps which include removing the hemoglobin from the lysate, heating the remaining soluble proteins in the presence of buffer and divalent metal ion until the carbonic anhydrase is inactivated, removing the precipitate, and separating the orgotein protein from the supernatant liquid.

3,579,496

SELECTIVE EXTRACTION PROCESS PRODUCING PROTEIN ISOLATES FROM OILSEED MEALS USING WATER OR DIVALENT METAL SALTS AS EXTRACTING AGENTS

Wilda H. Martinez and Leah C. Berardi, New Orleans, La., assignors to the United States of America as represented by the Secretary of Agriculture

Filed July 17, 1969, Ser. No. 842,576
Int. Cl. A23j *1/14;* C07g *7/00*
U.S. Cl. 260—123.5 26 Claims

A process for extracting selectively protein fractions from oilseed flour which process comprises a preliminary extraction with water or a dilute (.008 M) polyvalent cationic salt solution and subsequently with aqueous base (.015 N sodium hydroxide).

The protein isolates thus extracted differ in composition, average molecular weight and solubility characteristics. With certain oilseeds, the disclosed process provides for the recovery of somewhat more of the total nitrogen from the flour being processed and for an improved flavor and color in the major isolate than does a conventional single-step alkaline extraction process.

3,579,497

WATER-INSOLUBLE MONOAZO DYESTUFFS

Visvanathan Ramanathan, Basel, and Klaus Artz, Muttenz, Switzerland, assignors to Ciba Limited, Basel, Switzerland

No Drawing. Filed Oct. 31, 1967, Ser. No. 679,522
Claims priority, application Switzerland, Nov. 7, 1966, 16,002/66
Int. Cl. C09b *29/06;* D06p *1/02*
U.S. Cl. 260—158 10 Claims

Water-insoluble monoazo dyestuffs of the formula

A—N=N—B

in which A represents a benzene radical or a heterocyclic radical and B represents a benzene radical containing an amino group in para-position to the azo group, one of the hydrogen atoms of the amino group being replaced by an alkyl radical that may be substituted and the other being replaced by a phenalkyl radical bearing a negative substituent. The compounds are suitable for dyeing and painting materials such as fibers and fabrics.

3,579,498

METHOD OF MAKING AZO, 3-SUBSTITUTED PYRAZOLONE DYES

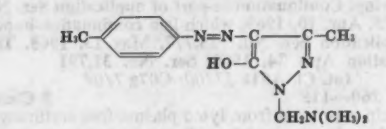
William Paul Dunworth, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 594,352, Nov. 15, 1966. This application Nov. 6, 1967, Ser. No. 680,968

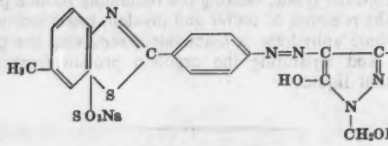
Int. Cl. C09b *29/38, 31/14, 33/12*

U.S. Cl. 260—158 8 Claims

Arylazo-, aryl disazo-, and benzothiazolylarylazo-1,3-substituted-5-pyrazolones, for example,



and



useful as paper dyes having good water solubility, bleachability, brightness, lightfastness and tinctorial strength, and as intermediates for cationic dyes which in turn are useful in dyeing acid modified acrylic, polyester and polyamide fibers.

3,579,499

AMINO ALKYL ESTERS OF 5β-PREGN-20-ENE-21-CARBOXYLIC ACIDS AND THE 3-GLYCOSIDES THEREOF

Richard Clarkson, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Filed July 1, 1968, Ser. No. 741,241

Claims priority, application Great Britain, July 10, 1967, 31,671/67

Int. Cl. C07c *173/00*

U.S. Cl. 260—210.5 5 Claims

The disclosure relates to aminoalkyl esters of 5β-pregn-20-ene-21-carboxylic acids, processes for their manufacture, pharmaceutical compositions containing them and a method of using them to increase the force of contraction of the heart of warm-blooded animals. Representative of the steroid derivatives disclosed is 2-dimethylaminoethyl 3β-14β-dihydroxy-5β-pregn-20-ene - 21 - carboxylate.

3,579,500

1-ARYL-3-ALKYLURETIDINEDIONES

Arthur G. Jelinek, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

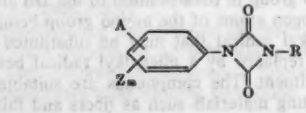
No Drawing. Filed May 28, 1968, Ser. No. 732,558

Int. Cl. C07d *47/00*

U.S. Cl. 260—239 9 Claims

Compounds useful as herbicides of the formula:

(I)



where

A is hydrogen, halogen, alkyl, alkoxy, nitro, cyano, trifluoromethyl, p-chlorophenoxy or m-(tertiary butylcarbamoyloxy);

Z is hydrogen or halogen;

m is 1 or 2, and

R is alkyl, cycloalkyl, methylcyclohexyl, cyclohexylmethyl, cyclopentylmethyl, allyl, methallyl.

Typical is 1-(3,4-dichlorophenyl)-3-methyluretidinedione.

3,579,501

6-[α-(3 - GUANYL - 1 - UREIDO)PHENYL- OR THIENYL-ACETAMIDO]PENICILLANIC ACIDS

Donald Neil McGregor, Fayetteville, N.Y., assignor to Bristol-Myers Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 780,557, Dec. 2, 1968. This application Aug. 22, 1969, Ser. No. 852,457

Int. Cl. C07d *99/16*

U.S. Cl. 260—239.1 16 Claims

6-[α-(3-guanyl - 1 - ureido)phenylacetamido]- and 6-[α-(3-guanyl - 1 - ureido)thienylacetamido] - penicillanic acids are valuable as antibacterial agents, nutritional supplements in animal feeds, therapeutic agents in poultry and animals, including man, and are especially useful in the treatment of infectious diseases caused by Gram-positive and Gram-negative bacteria, most particularly those caused by the Pseudomonas genus. 6-[D-α-(3-guanyl-1-ureido)phenylacetamido] - penicillanic acid, a preferred embodiment of the invention, is prepared by the reaction of 6-(D-α-amino - phenylacetamido) - penicillanic acid (ampicillin) with a guanylcarbamylating agent.

3,579,502

PROCESS FOR PREPARING TETRAHYDRO[2,1-d]-BENZO[f][1,4] - DIAZEPIN - 6(7H)- ONES AND INTERMEDIATES

Marcel Müller, Frenkendorf, and Paul Zeller, Allschwil, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Jan. 16, 1967, Ser. No. 609,321

Claims priority, application Switzerland, Jan. 21, 1966, 855/66

Int. Cl. C07d *53/06*

U.S. Cl. 260—239.3 4 Claims

In the instant case, there is disclosed various processes for preparing 5,9,10,14b-tetrahydroisoquino[2,1-d]-benzo[f][1,4]diazepin-6(7H)-ones(A). In one important process variation, a 1-(o-amino-phenyl)-3,4-dihydroisoquinoline(B) is reacted with a member capable of providing a halo-lower alkanoyl group such as halo lower alkanoyl halide to give a novel (2'-halo-lower alkanoyl-aminophenyl)(C) derivative. C is then ring closed to a novel 6-oxo - 6,7,9,10 tetrahydroisoquino[2,1-d]benzo[f][1,4]diazepin-(8)-ium(D). D is then reduced to A.

In another important process variation, B or a 1-(o-nitro-phenyl)-3,4-dihydroisoquinoline is treated with an α-substituted acetic acid derivative. The resulting product is reduced and ring closed at elevated temperatures to A.

Compounds A are useful for pharmaceutical purposes, e.g. as sedatives, as tranquilizers, as anti-convulsants and as muscle relaxants.

3,579,503

PYRROLO[3,2,1-jk][1,4]BENZODIAZEPINONES

Jackson B. Hester, Jr., Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Nov. 3, 1969, Ser. No. 873,718

Int. Cl. C07d *53/06*

U.S. Cl. 260—239.3 21 Claims

1,2 - dihydro - 7 - phenylpyrrolo[3,2,1-jk][1,4]benzodiazepin - 4(5H) - ones; 6,7 - dihydro - 7-phenyl-

pyrrolo[3,2,1 - jk][1,4]benzodiazepin - 4(5H)-ones; 7-phenylpyrrolo[3,2,1 - jk][1,4]benzodiazepin-4(5H)-ones; 1,2 - dihydro - 6 - phenylpyrrolo[1,2,3-ef][1,5]benzodiazepin - 4(5H) - ones; 1,2 - dihydro-4-phenylpyrrolo [1,2,3-ef][1,5]benzodiazepin - 6(7H) - ones and 1,2,4,5-tetrahydro - 4 - phenylpyrrolo[1,2,3 - ef][1,5]benzodiazepin-6(7H)-ones, processes for preparing the same and novel intermediates prepared by said processes. The novel compounds of this invention exhibit tranquilizing and anticonvulsant activity in animals.

3,579,504

DERIVATIVE OF $\Delta^{4,9}$-GONADIENE AND PROCESS OF PREPARATION

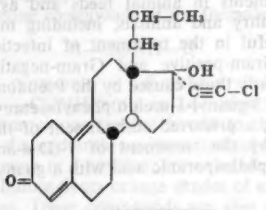
Gerard Nominé, Noisy-le-Sec, Robert Bucourt, Clichy-sous-Bois, and André Pierdet, Noisy-le-Sec, France, assignors to Roussel-UCLAF, S.A., Paris, France

No Drawing. Continuation-in-part of application Ser. No. 282,587, May 23, 1963. This application Apr. 26, 1965, Ser. No. 451,051

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.55 **8 Claims**

The present invention relates to a new derivative of $\Delta^{4,9}$-gonadiene of Formula I;



(I)

as well as a process of preparation of the said compound. The invention also relates to intermediates useful in the production of the compound of Formula I.

3,579,505

ALISOL COMPOUNDS

Masuo Miyamoto, Kyoto, and Tadakazu Murata, Suita, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

No Drawing. Filed Sept. 25, 1968, Ser. No. 762,637

Int. Cl. C07c *169/38, 173/00*

U.S. Cl. 260—239.55 **17 Claims**

The crude extract of an Alismataceae plant or saponification product thereof is brought into contact with an acid (mineral acid, sulfonic acid, carboxylic acid, Lewis acid) whereby the Alisol B contained in the extract is converted into Alisol A. The Alisol compounds of the invention, including Alisol A itself, show hypercholesterolemic actviities.

3,579,506

α-AMINOISOTHIAZOLYLACETIC ACIDS AND THEIR PENICILLIN AND CEPHALOSPORIN DERIVATIVES

Raymond Urgel Lemieux and Rintje Raap, Edmonton, Alberta, Canada, assignors to R & L Molecular Research Ltd., Edmonton, Alberta, Canada

No Drawing. Filed Oct. 23, 1968, Ser. No. 770,068

Int. Cl. C07d *99/24, 99/16*

U.S. Cl. 260—239.1 **13 Claims**

α-aminoisothiazolylacetic acid derivatives of 6-amino- have been prepared and used in the preparation of α-aminoisothiazolylacetic acid derivatives of 6-aminopenicillanic acid and 7-aminocephalosporanic acid which have been found to be useful as antibacterial agents.

3,579,507

7α,8α-DIFLUOROMETHYLENE STEROIDS

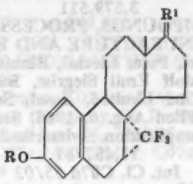
David J. Marshall, Hampstead, Quebec, and Amedeo A. Failli, Montreal, Quebec, Canada, assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed July 28, 1969, Ser. No. 845,538

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.5 **10 Claims**

7α,8α-difluoromethylene steroids of the formula



in which R represents hydrogen, lower alkyl or cycloalkyl, or lower aliphatic acyl and R^1 represents O (ketonic oxygen) or the group

in which R^2 represents hydrogen, lower alkyl, lower alkynyl, lower dialkynyl, 2- or 3-furyl, or 2- or 3-thienyl groups.

3,579,508

21-SUBSTITUTED 6-CHLORO - 16α,17α-ISOPROPYLIDENEDIOXY-PREGNA - 4,6 - DIENE-3,20-DIONE AND METHOD OF PREPARING THE SAME

Milton David Heller, New City, N.Y., Robert Herman Lenhard, Paramus, N.J., and Seymour Bernstein, New City, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Mar. 20, 1969, Ser. No. 808,983

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.55 **1 Claim**

The compounds 21-chloro or 21-methanesulfonyloxy-6-chloro-16α,17α-isopropylidendioxypregna-4,6 - diene - 3, 20-dione are described along with methods of preparing the same. They are useful as anti-fertility agents.

3,579,509

PROCESS AND 6-β-SUBSTITUTED ETHYL INTERMEDIATES FOR PREPARING 6,6-ETHYLENE-3-KETO-Δ^4 STEROIDS

Kenneth G. Holden, Stratford, N.J., assignor to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Continuation-in-part of abandoned application Ser. No. 465,788, June 21, 1965. This application Sept. 20, 1965, Ser. No. 488,758

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.57 **17 Claims**

6,6 - ethylene steroids having potent, often enhanced, pharmacodynamic activity compared with their respective parent compounds are prepared by condensing a 3-lower alkoxy-3,5-diene steroid with β-acyloxyethylmercuric acylate, hydrolyzing the resulting 6-β-acyloxyethyl-3-lower alkoxy-3,5-diene steroid to give a 6-β-hydroxyethyl-3-lower alkoxy-3,5-diene steroid or a 6-β-hydroxyethyl-3-keto-Δ^4 steroid, esterifying same and cyclizing said ester.

3,579,510

3-(HYDROXY-PHENYL) SUBSTITUTED AMIDINES AND DERIVATIVES THEREOF AS ANTHELMINTIC AGENTS

James W. McFarland, Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

No Drawing. Filed Aug. 30, 1967, Ser. No. 664,258

Int. Cl. C07c *123/00;* **C07d** *49/34, 51/36*

U.S. Cl. 260—240 **4 Claims**

The preparation and anthelmintic properties of certain ω-(3-R-O-phenyl)substituted cyclic and acyclic amidines;

namely, 1,4,5,6-tetrahydro-2-[2-(3-R-O-phenyl)ethyl]pyrimidines, 1,4,5,6 - tetrahydro-2-[2-(3-R-O-phenyl)vinyl] pyrimidines and the corresponding 2-imidazolines; and N-methyl - N - substituted 3-(3-R-O-phenyl)propionamidines and the corresponding acrylamidines wherein R-O, is hydroxy or a group convertible to hydroxy, is described.

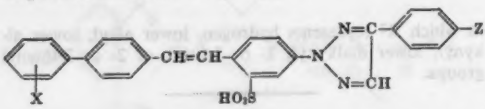
3,579,511

TRIAZOLE COMPOUNDS, PROCESSES FOR THEIR MANUFACTURE AND USE

Kurt Weber, Basel, Peter Liechti, Binningen, and Rudolf Meyer and Adolf Emil Siegrist, Basel, Switzerland, assignors to Ciba Limited, Basel, Switzerland

No Drawing. Filed Aug. 6, 1968, Ser. No. 750,465
Claims priority, application Switzerland, Aug. 16, 1967, 11,487/67
Int. Cl. C07d *55/02*
U.S. Cl. 260—240 **2 Claims**

The invention comprises new triazole derivatives which are useful as optical brighteners—especially for detergents as well as cellulose and polyamide fibers—and which correspond to the formula



wherein Z represents hydrogen or a phenyl group and X signifies a sulphonic acid group or a hydrogen atom where Z represents a hydrogen atom, whilst if Z=phenyl the symbol X represents a sulphonic acid group, as well as their alkali or ammonium salts.

3,579,512

1-(4-PIPERIDYL)-BUTANONES

Hans Herbert Kühnis, Basel, and Ulrich Renner, Riehen, near Basel, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

No Drawing. Filed Dec. 30, 1968, Ser. No. 788,069
Claims priority, application Switzerland, Jan. 11, 1968, 423/68
Int. Cl. C07d *29/20*
U.S. Cl. 260—240 **5 Claims**

4-alkanoylpiperidine derivatives being further substituted in 4-position by allyl, propinyl or alkyl having from 2 to 4 carbon atoms and in 1-position by alkyl having at most 10 carbon atoms, cinnamyl or phenyl-loweralkyl, wherein the phenyl moiety is unsubstituted or substituted by halogen, loweralkyl or loweralkoxy, whereby the substituted or unsubstituted phenyl-loweralkyl contains at most 12 carbon atoms, and wherein the phenyl group is bound directly to the loweralkyl group or by way of various other moieties, such as hydroxymethylene, imino or alkenylimino, and the pharmaceutically acceptable acid addition salts thereof, have analgesic and antitussive activities; pharmaceutical compositions and methods of alleviating pain and producing an antitussive effect with these compounds are provided; an illustrative embodiment is 1-[1 - (3-phenylpropyl)-4-allyl-4-piperidyl]-butanone fumarate.

3,579,513

1-(1-SUBSTITUTED-4-ACETONYL-4-PIPERIDYL)-1-BUTANONES

Hans Herbert Kühnis, Basel, and Ulrich Renner, Riehen, near Basel, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

No Drawing. Filed Dec. 30, 1968, Ser. No. 788,070
Claims priority, application Switzerland, Jan. 11, 1968, 424/68
Int. Cl. C07d *29/20*
U.S. Cl. 260—240 **3 Claims**

4-acetonyl-4-alkanoyl-piperdine derivatives, substituted in 1-position by lower alkyl to which is attached either directly or by way of a vinylene, an oxygen, a carbonyl, a hydroxymethylene, an imino, an alkanoyloxymethylene, an alkylimino, an alkenylimino or an alkanoylimino group, a substituted or unsubstituted phenyl moiety, have analgesic and antitussive properties; pharmaceutical compositions comprising these compounds and methods for alleviating pain and producing an antitussive effect are providel; an illustrative embodiment is 1-[1-(3-phenylpropyl)-4-acetonyl-4-piperidyl]-1-butanone.

3,579,514

7 - [α-(3 - GUANYL-1-UREIDO)ARYL-ACETAMIDO] CEPHALOSPORANIC ACIDS AND DERIVATIVES THEREOF

Donald Neil McGregor, Fayetteville, N.Y., assignor to Bristol-Myers Company, New York, N.Y.

No Drawing. Filed Jan. 24, 1969, Ser. No. 793,909
The portion of the term of the patent subsequent to May 18, 1988, has been disclaimed
Int. Cl. C07d *99/24*
U.S. Cl. 260—243C **27 Claims**

7-[α-(3-guanyl-1-ureido)phenylacetamido]- and 7-[α-(3 - guanyl - 1 - ureido)thienylacetamido]cephalosporanic acids and the corresponding betaines and desacetoxy derivatives are valuable as antibacterial agents, as nutritional supplements in animal feeds and as therapeutic agents in poultry and animals, including man, and are especially useful in the treatment of infectious diseases caused by Gram-positive and Gram-negative bacteria, most particularly those caused by the Pseudomonas genus. 7 - [D - α - (3-guanyl-1-ureido)phenylacetamido]cephalosporanic acid, a preferred embodiment of the invention, is prepared by the treatment of 7-(D-α-amino-phenylacetamido)cephalosporanic acid with a guanylcarbamoylating agent.

3,579,515

MOLECULAR COMPLEXES OF CYCLIC CARBAMATE POLYMERS WITH PHENOLS AND THIOPHENOLS

Wilhelm E. Walles, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of application Ser. No. 573,488, Aug. 19, 1966, which is a continuation-in-part of application Ser. No. 12,254, Mar. 2, 1960. This application Feb. 4, 1969, Ser. No. 796,592
Int. Cl. C08f *7/12*
U.S. Cl. 260—244 **1 Claim**

Stable complexes of phenols or thiophenols with cyclic carbamate polymers such as poly(vinyl oxazolidinone).

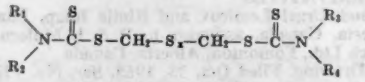
3,579,516

BIS(THIOCARBAMYLTHIOMETHYL) POLYSULFIDES

Harry Elmer Albert, deceased, late of Lafayette Hill, Pa., by Dorothy S. Albert, executrix, Lafayette Hill, Pa., assignor to Pennwalt Corporation

No Drawing. Filed Nov. 29, 1968, Ser. No. 781,691
Int. Cl. C07d *87/46*
U.S. Cl. 260—246 **10 Claims**

Novel compounds having the structure



where R_1 and R_2 are alkyl or aryl, R_2 and R_4 are alkyl with the understanding that R_1 and R_2 and R_3 and R_4 may form a ring, and where x is an integer of from 2 to 6. These new compositions are useful as accelerators for the sulfur vulcanization of unsaturated elastomers and may be used as vulcanizing agents.

3,579,517
SECONDARYAMINO PYRIDAZINES
William J. Houlihan and Robert E. Manning, Mountain Lakes, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.
No Drawing. Continuation-in-part of application Ser. No. 849,151, Aug. 11, 1969, which is a continuation-in-part of application Ser. No. 671,962, Oct. 2, 1967. This application Sept. 22, 1969, Ser. No. 860,059
Int. Cl. C07d *51/04*
U.S. Cl. 260—250 16 Claims

Secondaryamino pyridazines and hydrazine substituted secondaryamino pyridazines, e.g., 3,6-dichloro-4-diallylaminopyridazine and 3 - chloro - 4 - dimethylamino-6-hydrazinopyridazine, are prepared from 3,4,6-trihalopyridazines and are useful as central nervous system stimulants and as anti-hypertensives.

3,579,518
ANTHRAPYRIMIDINE-SUBSTITUTED ANTHRAQUINONE AMIDES
Eduard Moergeli, Muttenz, Switzerland, assignor to Ciba Limited, Basel, Switzerland
No Drawing. Filed Feb. 20, 1968, Ser. No. 706,784
Claims priority, application Switzerland, Mar. 8, 1967, 3,394/67
Int. Cl. C07d *51/46*
U.S. Cl. 260—256.4 7 Claims

Anthraquinone compounds of the formula

A—CONH—B

in which A represents a 1,9 anthrapyrimidine radical bound to the —CONH-group in 2-position and B represents an anthraquinone residue bound to the NH-group in 1-position, the said anthraquinone radical containing an aroylamino group in 4-position, are valuable vat dyestuffs which dye cellulose-fibers orange shades of excellent fastness properties. These compounds are also valuable pigments which color plastic masses orange shades of outstanding fastness to light and migration.

3,579,519
CRYSTALLINE FORM OF QUINACRIDONE
Hans R. Schweizer, Herrliberg, Switzerland, assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Sept. 8, 1966, Ser. No. 577,932
Int. Cl. C07d *37/18*
U.S. Cl. 260—279 5 Claims

An improved quinacridone having good light fastness, a more-reddish shade with high tinctorial power and a soft texture is prepared by a process which comprises dissolving quinacridone prepared by known methods in hot hexamethyl phosphoramide at a temperature above 100° C. The solution is then poured into a cold non-solvent such as methanol. The precipitated quinacridone is subsequently separated from the mixture. Quinacridone prepared by the described procedure is useful as a pigment for coloring dopes and melts in the manufacture of molded objects, fibers, films, etc.

3,579,520
4-(4-PIPERIDINYL-METHYL OR -1-ETHYL) AMINO-7-CHLOROQUINOLINES
Denis M. Bailey, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 596,401, Oct. 23, 1966, now Patent No. 3,505,339, dated Apr. 7, 1970. This application Aug. 21, 1969, Ser. No. 852,067
Int. Cl. C07d *33/52*
U.S. Cl. 260—288 5 Claims

4-(4-piperidinyl-methyl or -1-ethyl)amino - 7 - chloroquinolines where 4-piperidinyl is substituted at its 1-position by ethyl or 2-hydroxyethyl, having chemotherapeutic and pharmacological properties, are prepared by reacting 4,7-dichloroquinoline with the corresponding 1-substituted-4-piperidinyl-methyl or -1-ethylamines, the latter novel amines being prepared by various generally known reduction procedures.

3,579,521
PRODUCTION OF VINYL SUBSTITUTED AROMATICS FROM METHYL SUBSTITUTED AROMATICS
Raymond A. Franz, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Jan. 15, 1969, Ser. No. 791,482
Int. Cl. C07c *3/00, 15/24;* C07d *31/20*
U.S. Cl. 260—290 9 Claims

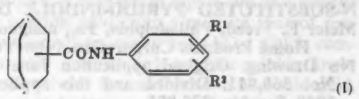
Vinyl substituted aromatic compounds are produced in a non-catalytic process by contacting a methyl substituted aromatic compound with an oxygen containing organic compound selected from the group consisting of acetic acid, dimethyl ether, di-t-butyl peroxide and diketene. The contacting is carried out at a temperature of from about 700 to about 950° C. at a pressure of not more than four atmospheres absolute.

3,579,522
PROCESS FOR THE PRODUCTION OF POLYESTER VARNISH SOLUTIONS
Otto Bendszus and Clemens Niehaus, Krefeld, and Manfred Patheiger, Krefeld-Uerdingen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Jan. 21, 1969, Ser. No. 792,849
Claims priority, application Germany, Feb. 5, 1968, P 16 44 816.1
Int. Cl. C08g *51/22*

A varnish solution comprising a polyester of an α,β-unsaturated dicarboxylic acid dissolved in a copolymerizable ethylenically unsaturated monomer, said solution having a thixotropy ΔF of at least about 10% and containing a liquid organopolysiloxane.

3,579,523
ANILIDES OF QUINUCLIDINE-2- AND QUINUCLIDINE-3-CARBOXYLIC ACID
Rune Verner Sandberg, Jarna, and Berndt Olof Harald Sjoberg, Sodertalje, Sweden, and Claes Philip Tegner, deceased, late of Sodertalje, Sweden, by Gunnel Margareta Tegner, executrix, Sodertalje, Sweden, assignors to Aktiebolaget Astra, Sodertalje, Sweden
No Drawing. Filed May 17, 1968, Ser. No. 729,947
Claims priority, application Sweden, May 23, 1967, 7,251
Int. Cl. C07d *36/09*
U.S. Cl. 260—293.4 7 Claims

A process for preparing anilides of quinuclidine-2- and quinuclidine-3-carboxylic acid, their therapeutically acceptable salts, and pharmaceutical preparations is disclosed, as well as anilide compounds of the formula:



(I)

wherein R_1 and R_2 may be the same or different and represent hydrogen, halogen, or alkyl having at most three carbon atoms. Antiarrhythmic and local anesthetic effects of the disclosed compounds are shown.

3,579,524

2-AMINOALKYL DERIVATIVES OF PHTHALIMIDINES

John William Van Dyke, Jr., Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

No Drawing. Filed June 5, 1968, Ser. No. 734,574
Int. Cl. C07d *29/30*
U.S. Cl. 260—294 6 Claims

2-aminoalkyl derivatives of phthalimidine that are useful as antihypertensive agents. Prepared by reacting phthalic anhydride with a suitable amine and selectively reducing one of the oxo groups of the resulting phthalimide to form the desired compound.

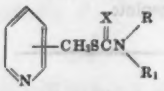
3,579,525

S-(PYRIDYL)METHYL THIO- AND DITHIO-CARBAMATES

Harry Tilles, El Cerrito, and Mervin E. Brokke, Moraga, Calif., assignors to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed Oct. 7, 1968, Ser. No. 765,681
Int. Cl. C07d *31/50*
U.S. Cl. 260—294.8 32 Claims

S-(pyridyl)methyl thio- and dithio-carbamates having the formula



in which X is oxygen or sulfur, R and R_1 are independently alkyl, alkenyl, or cyclohexyl and R and R_1 taken together are alkylene and dialkyl substituted alkylene, provided that when X is sulfur and R and R_1 are both alkyl, at least one of the alkyl groups contains 3 or more carbon atoms. The above compounds, as well as those excluded by the proviso, are effective herbicides. Representative compounds are

S-(3-pyridyl)methyl di-n-propylthiocarbamate,
S-(2-pyridyl)methyl di-n-butylthiocarbamate,
S-(4-pyridyl)methyl methylcyclohexylthiocarbamate,
S-(4-pyridyl)methyl ethyl-n-butylthiocarbamate and S-(3-pyridyl)methyl 1-(5-ethyl-2-methyl-piperidinecarbothioate).

3,579,526

PREPARATION OF THIENOPYRIDINES

Le Roy H. Klemm and Joseph Shabtai, Eugene, Oreg., and David R. McCoy, Wappingers Falls, N.Y., assignors to Research Corporation, New York, N.Y.

No Drawing. Filed Nov. 13, 1968, Ser. No. 775,534
Int. Cl. C07d *31/50*
U.S. Cl. 260—294.8 13 Claims

Thienopyridines are prepared by the decomposition of benzyl 2-(pyridyl) ethyl sulfides. The thermal decomposition may be catalytic or non-catalytic and is desirably carried out at a temperature in the range 500–700° C. Thieno[3,2-b] pyridine is prepared by the thermal decomposition of benzyl 2-(2-pyridyl) ethyl sulfide and thieno[2,3-c] pyridine is prepared by the thermal decomposition of benzyl 2-(4-pyridyl) ethyl sulfide.

3,579,527

N-SUBSTITUTED PYRIDO-INDOLE DERIVATIVES

Meier E. Freed, Philadelphia, Pa., assignor to American Home Products Corporation, New York, N.Y.

No Drawing. Original application June 27, 1966, Ser. No. 560,811. Divided and this application July 18, 1969, Ser. No. 870,805
Int. Cl. C07d *39/00*
U.S. Cl. 260—296 2 Claims

N-substituted-tetrahydropyrido-indoles are prepared having useful pharmacological activity, particularly on the central nervous system.

3,579,528

2,6-DIHYDROXYTRICHLOROPYRIDINE AND ITS PREPARATION

Robert Neville Haszeldine, "Windyridge," Lyme Road, Disley, Cheshire, England, and William Thain Flowers, 19 Birch Grove, Rusholme, Manchester 14, England

No Drawing. Filed May 22, 1968, Ser. No. 731,273
Claims priority, application Great Britain, June 7, 1967, 26,218/67
Int. Cl. C07d *31/28*
U.S. Cl. 260—297 4 Claims

The new compound 2,6-dihydroxytrichloropyridine is prepared by reacting 2,6-diaminopyridine with chlorine while in admixture with aqueous mineral acid. The dihydroxytrichloropyridine is useful as a contact herbicide and as a novel intermediate in the preparation of pentachloropyridine.

3,579,529

HETEROCYCLIC COMPOUNDS

Kevan Brown, Woodley, and John F. Cavalia, Isleworth, England, assignors to John Wyeth & Brother Limited, Taplow Maidenhead, England

No Drawing. Filed Oct. 15, 1968, Ser. No. 767,853
Claims priority, application Great Britain, Oct. 26, 1967, 48,641/67
Int. Cl. C07d *91/32, 85/44*
U.S. Cl. 260—302 11 Claims

A group of oxazoles and thiazoles substituted by a cycloaliphatic radical in the 2-position and an aliphatic acidic radical in the 4-position is described. The compounds are useful as anti-inflammatory agents.

3,579,530

PROCESS FOR THE RESOLUTION OF RACEMIC TETRAMISOLE

Robert Alfred Dewar, Ashburton, Victoria, Volker Elmar Maier, Hampton, Victoria, and Margaret Anthea Ingram, South Yarra, Victoria, Australia, assignors to Imperial Chemical Industries of Australia and New Zealand Limited

No Drawing. Filed Aug. 12, 1968, Ser. No. 751,716
Claims priority, application Australia, Aug. 24, 1967, 26,376; Jan. 11, 1968, 32,285; Jan. 18, 1968, 32,424
Int. Cl. C07d *99/06*
U.S. Cl. 260—306.7 7 Claims

Resolution of tetramisole into its optically active D- and L-isomers using a resolving acid in a predominantly aqueous medium whereby said acid forms a salt with one of the isomers and said salt crystallises from the medium to the substantial exclusion of the other tetramisole isomer salt.

3,579,531

PROCESS FOR PREPARING 1-PHENYL-1,2,3-TRIAZOLES

Peter Scheiner, Princeton, N.J., assignor to Mobil Oil Corporation

No Drawing. Filed Feb. 28, 1968, Ser. No. 708,753
Int. Cl. C07d *55/02*
U.S. Cl. 260—308 6 Claims

Phenyl triazole and various substituted phenyl triazoles are prepared by reacting substituted phenyl azides or phenyl azide with a vinyl ester of a lower alkanoic acid preferably vinyl acetate, at reflux temperature and at atmospheric pressure. 1-phenyl-1,2,3-triazole and substituted derivatives thereof are stabilizers for polyolefins. The 1-halophenyl-1,2,3-triazoles are effective fungicides and miticides.

3,579,532

BIS-PHOSPHONO-PROPIONAMIDE SUBSTITUTED ETHYLENE GLYCOLS AND IMIDAZOLIDINONES

Hermann Nachbur, Dornach, Switzerland, Bernard Peter Stark, Stapleford, Cambridge, England, and Arthur Maeder, Therwil, Switzerland, assignors to Ciba Limited, Basel, Switzerland

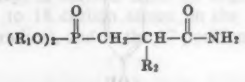
No Drawing. Filed July 22, 1968, Ser. No. 746,308

Claims priority, application Great Britain, July 28, 1967, 34,922/67

Int. Cl. C07d *49/34*

U.S. Cl. 260—309.7 10 Claims

This invention provides phosphorus-containing products which are obtained by reacting a compound of the formula



wherein R_1 represents a substituent bound through a carbon atom to the oxygen atom and R_2 e.g. a hydrogen atom or a methyl group, with glyoxal, formaldehyde, urea and an etherifying agent like a saturated or unsaturated aliphatic alcohol.

These phosphorus-containing reaction products are useful as agents for flameproofing.

3,579,533

PREPARATION OF PORPHIN, SUBSTITUTED PORPHIN AND METAL CHELATES THEREOF

Richard G. Yalman, Yellow Springs, Ohio, assignor to Antioch College, Yellow Springs, Ohio

No Drawing. Filed Mar. 18, 1968, Ser. No. 714,064

Int. Cl. C07d *27/76*

U.S. Cl. 260—314 10 Claims

Preparation of porphin, meso monomethyl-, meso dimethyl-, meso trimethyl-, and meso tetramethylporphin, and the metal chelates thereof in relatively large quantities with yields in the range of 1% to 20% is accomplished by cyclic condensation of a pyrrole having a primary or secondary carbinol in the 2 position thereof to form a metal chelate followed by demetallation to form porphin or the meso substituted porphin. The reaction mixture includes the hydroxypyrrole, a metal acetate, an organic acid and a polar solvent, and by (1) controlling the pH of the buffer formed by the metal acetate and the acid to between 3.2 and 5.5 based on a water system, (2) controlling the temperature of the reaction mixture in the range of 120° C. to 150° C., and (3) reducing the self-polymerization of the hydroxy-pyrrole by dropwise addition of a precooled mixture thereof to a preheated solvent system, much improved yields of the metal chelates are obtained. Also, the yields of porphin and meso substituted porphins were increased by an improved demetallation procedure permitting 75% to 85% yields from the corresponding metal chelates. Various metal acetates, solvents, temperature ranges, ratios of reactants and reaction conditions and techniques are described.

3,579,534

TETRAHYDROCARBAZOLECARBOXYLATES

Ruddy Littell, Rivervale, and George Rodger Allen, Jr., Old Tappan, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed May 9, 1969, Ser. No. 823,471

Int. Cl. C07d *27/68*

U.S. Cl. 260—315 6 Claims

Preparation of substituted tetrahydrocarbazolecarboxylic derivatives, are described. They are useful for their central nervous system activity, as anticonvulsants.

3,579,535

SUBSTITUTED PHENYLACETIC ACIDS AND ESTERS THEREOF

Rolf Denss, 43 Schutzenmattstr., Basel, Switzerland; Niels Clauson-Kaas, 28 Rugmarken, Farum, Denmark; and Franz Ostermayer, 5 Am Hang, Riehen, Switzerland

No Drawing. Filed Oct. 30, 1967, Ser. No. 679,224

Claims priority, application Switzerland, Oct. 31, 1966, 15,768; Jan. 31, 1967, 713; Aug. 7, 1967, 11,178

Int. Cl. C07d *27/26*

U.S. Cl. 260—326.3 24 Claims

Substituted phenyl acetic acids, addition salts thereof with bases as well as esters thereof, which compounds exhibit useful antiinflammatory (antiphlogistic), analgesic and antipyretic activity, and processes for the production of these compounds, as well as starting materials used in said processes; therapeutic compositions containing these compounds, and methods of treatment, particularly methods of inducing antiinflammatory, analgesic and antipyretic effects in mammals. Illustrative embodiments are 2-[p-(1-pyrryl)-phenyl]-butyric acid, [3-chloro-4-(1-pyrryl)-phenyl]-acetic acid and 2-[p-(1-pyrryl)-phenyl]-propionic acid methyl ester.

3,579,536

ADDITION PRODUCTS OF METHYLFORMAMIDE OR SUCCINIMIDE WITH GLYOXAL

Sidney L. Vail and Andrew G. Pierce, Jr., New Orleans, La., Clifford M. Moran, San Gabriel, Calif., and Robert H. Barker, Metairie, La., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Feb. 23, 1966, Ser. No. 529,251

Int. Cl. C07d *27/10*

U.S. Cl. 260—326.3 3 Claims

The invention provides the compounds N,N'-dihydroxyethylenebis(methylformamide), N,N'-dihydroxyethylenebissuccinimide, and N,N'-(1,2-diacetoxyethylene)bissuccinimide which are useful as textile finishing agents for cellulosic fabrics, in resin applications, and in pharmaceutical and allied industries.

3,579,537

PROCESS FOR SEPARATION OF SULTONES FROM ALKENYL SULFONIC ACIDS

Joseph Rubinfeld and Henry Leon Levinsky, Brooklyn, N.Y., assignors to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Filed Aug. 15, 1966, Ser. No. 581,409

Int. Cl. C07c *143/16*; C07d *89/06*

U.S. Cl. 260—327 13 Claims

The instant process is directed to separation of a sultone and an alkenyl sulfonic acid from a mixture thereof prepared by sulfonation of an olefin with SO_3, which comprises adding to said mixture (a) a water-soluble lower ketone which is a solvent for said sultone and said acid, and (b) a base which forms with said sulfonic acid a water soluble sodium, potassium, lithium or ammonium salt insoluble in said solvent, whereby to form a precipitate of said salt and a solution of said sultone, the temperature at the time of formation of said precipitate being at least about 15° C.

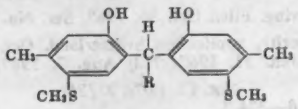
3,579,538

SUBSTITUTED BIS(2-HYDROXY-4-METHYL-5-METHYLTHIOPHENYL) METHANES

Ronald J. Meyer, Orville E. Horsley, and Herman J. Eichel, Cincinnati, Ohio, assignors to American Hoechst Corporation, New York, N.Y.

No Drawing. Filed June 26, 1968, Ser. No. 740,054
Int. Cl. C07c *15/12*; C07d *63/12, 63/22*
U.S. Cl. 260—330.5 1 Claim

Substituted bis(2 - hydroxy - 4 - methyl - 5 - methylthiophenyl)methane compounds having laxative (cathartic) properties of the general formula:



and a process for preparing them.

3,579,539

DUAL SOLVENT SEPARATION OF 4-HYDROXYBENZOTHIOPHENE FROM 4-OXO-4,5,6,7-TETRAHYDROBENZOTHIOPHENE

Edward M. Bullard, Fords, N.J., assignor to Mobil Oil Corporation

Filed Jan. 16, 1969, Ser. No. 791,614
Int. Cl. C07d *63/18, 63/22*
U.S. Cl. 260—330.5 2 Claims

4-hydroxybenzothiophene is separated from 4-oxo-4,5,6,7-tetrahydrobenzothiophene by liquid-liquid extraction using a dual solvent system of a polar solvent, preferably propylene glycol, and a non-polar solvent, preferably toluene. The 4-hydroxybenzothiophene can be converted into N-methyl-4-benzothienyl carbamate, an effective pesticide (see U.S. 3,288,673 and 3,288,808).

3,579,540

METHOD FOR PROTECTING NONPOROUS SUBSTRATES AND FOR RENDERING THEM WATER REPELLENT

Howard G. Ohlhausen, 82 Graymoor Lane, Olympia Fields, Ill. 60461

No Drawing. Filed Nov. 1, 1968, Ser. No. 772,856
Int. Cl. C08g *31/02, 51/34*
U.S. Cl. 260—33.4 16 Claims

Method and composition for treating nonporous substrates to protect and render same water repellent. A mineral acid is added to a solvent and an alkyl polysiloxane is then added to that mixture to produce the composition. The alkyl polysiloxane has the formula:

wherein n is an integer greater than 1, R_1 is a lower alkyl containing 1–7 carbon atoms and R_2 is hydrogen, a lower alkyl containing 1–7 carbon atoms or an aryl radical containing about 6 carbon atoms.

3,579,541

CYCLIC DIPEROXIDES

Yun G. Chang, Austin, Tex., assignor to Reichhold Chemicals, Inc., White Plains, N.Y.

No Drawing. Filed June 4, 1968, Ser. No. 734,258
Int. Cl. C07d *19/00*
U.S. Cl. 260—338 9 Claims

Cyclic peroxides are prepared by reacting hydroxy acetone with a difunctional hydroperoxide. The reaction takes place in a solvent at a temperature ranging from about 0° C. to 100° C. in presence of an acidic catalyst. The resulting cyclic peroxides are found to be highly efficient polymerization initiators and cross-linking agents.

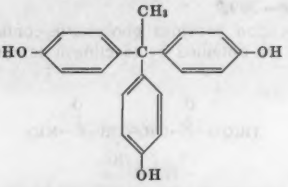
3,579,542

4,4',4''-TRIHYDROXYTRIPHENYLMETHYLMETHANE

Ronald J. Meyer, Orville E. Horsley, and Herman J. Eichel, Cincinnati, Ohio, assignors to American Hoechst Corporation, New York, N.Y.

No Drawing. Filed June 26, 1968, Ser. No. 740,066
Int. Cl. C09b *11/08*
U.S. Cl. 260—395 1 Claim

4,4',4''-trihydroxytriphenylmethylmethane having laxative (cathartic) properties of the formula:



and a process for preparing it.

3,579,543

$\Delta^{1,3,5(10)}$-2- (OR 4-)FORMYL-3-HYDROXYOESTRATRIENE COMPOUNDS

Max Salomon de Winter and Jan Evert Ribbers, Oss Netherlands, assignors to Organon Inc., West Orange, N.J.

No Drawing. Filed May 13, 1966, Ser. No. 549,786
Claims priority, application Netherlands, May 22, 1965, 6506542; Jan. 15, 1966, 6600548
Int. Cl. C07c *167/14*
U.S. Cl. 260—397.4 2 Claims

$\Delta^{1,3,5(10)}$-3-hydroxy-oestratriene compounds substituted in position 2 or 4 by a formyl group, and the 3-ethers or 3-esters thereof, are prepared by reacting the 3-hydroxy-oestratriene compound with chloroform in the presence of a metal hydroxide, followed by etherification or esterification of the 3-hydroxy group. The resulting products are biologically active in decreasing the serum concentration of cholesterol and the cholesterol/phospholipid ratio, and exhibit weak estrogenic activity and osteotrophic activity.

3,579,544

TOTAL PROCESS FOR MAKING 13-HYDROCARBON SUBSTITUTED GONAPOLYENE - 17 - ONE COMPOUNDS AND INTERMEDIATES PRODUCED IN THE COURSE OF THE PROCESS

Kentaro Hiraga, Ikeda, Tsunehiko Asako, Suita, and Takuichi Miki, Amagasaki, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

No Drawing. Filed May 24, 1968, Ser. No. 731,968
Claims priority, application Japan, May 24, 1967, 42/32,973; May 25, 1967, 42/33,238
Int. Cl. C07c *169/08*
U.S. Cl. 260—397.5 9 Claims

A compound having a 16-(etherified or esterified hydroxy)-17-acyloxy-13 - substituted gona-1,3,5(10),8,14-pentaene nucleus is obtained by allowing a compound having a 17-acyloxy-13-substituted 8,14-secogona-1,3,5(10),9(11),15-pentaene-14-one nucleus to contact with an acid catalyst in presence of alcohol, phenol or fatty acid, and converting the resultant compound having a 16-(etherified or esterified hydroxy)-17-acyloxy-13-substituted gona-1,3,5(10),8,14-pentaene nucleus, directly or after reduction of its double bond at the 8-position or bands at the 8- and 14-positions, to a compound having a 13-(hydrocarbon substituted)gonapolyen-17-one nucleus. It is thus made possible to effect the total synthesis of the gona polyenes (e.g. estrone) via a lesser number of steps than has heretofore been possible.

3,579,545

NOVEL 11β-ALKOXY GONA-1,3,5(10)-TRIENES

Daniel Bertin, Montrouge, and Andre Pierdet, Noisy-le-Sec, France, assignors to Roussel-UCLAF, Paris, France

No Drawing. Continuation-in-part of application Ser. No. 643,062, June 2, 1967. This application Aug. 25, 1969, Ser. No. 852,905

Claims priority, application France, Sept. 7, 1966, 75,528; Dec. 9, 1966, 86,879; Feb. 28, 1967, 96,848; Mar. 9, 1967, 98,154

Int. Cl. C07c *169/08*

U.S. Cl. 260—397.5 20 Claims

Novel 11β-lower alkoxy-$\Delta^{1,3,5(10)}$-gonatrienes substituted in the 3-position by a member selected from the group consisting of hydroxy, alkoxy of 1 to 4 carbon atoms, cycloalkoxy of 5 to 6 carbon atoms, and acyloxy, wherein the acyl is derived from an organic carboxylic acid having 1 to 18 carbon atoms, in the 13-position by a lower alkyl radical, and in the 17-position by the grouping

wherein X is selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms, and Y is selected from the group consisting of a hydrocarbon radical and a substituted hydrocarbon radical. These compounds possess estrogenic activity.

3,579,546

ORGANIC SULFONATE PRODUCTION BY BUFFERED ADDITION OF BISULFITE TO UNSATURATED HYDROCARBONS

Charles J. Norton, Berkeley, Calif., assignor to Marathon Oil Company, Findlay, Ohio

No Drawing. Filed Sept. 30, 1968, Ser. No. 763,929

Int. Cl. C07c *143/90*

U.S. Cl. 260—400 10 Claims

This invention details a process for the manufacture of organic sulfonates from unsaturated hydrocarbons containing 6 to about 30 carbon atoms per molecule including reacting the unsaturated hydrocarbons and bisulfite in a cosolvent system comprising water and an organic hydroxyl-containing compound at from 0 to about 300° C. in the presence of a free radical initiator. Also, a sufficient quantity of a buffer compound is present to maintain the pH from about 5 to about 9, where the buffer is a partially neutralized non-bisulfite poly-basic weak acid. The buffer is left in the reaction mixture as a builder for the final alkane sulfonate highly biodegradable low foam detergent formulation.

3,579,547

CARBOXYLIC ACID ESTERS

James T. Traxler, Evanston, Ill., assignor to SCM Corporation, New York, N.Y.

No Drawing. Filed Dec. 16, 1966, Ser. No. 602,166

Int. Cl. C11c *3/04*

U.S. Cl. 260—410.6 15 Claims

Novel internal carboxylic acid esters of linear aliphatic polyatomic alcohols have been prepared. The polyatomic alcohols comprising the alcohol portion of the esters contain from 4 to 12 carbon atoms and the carboxylic acid portion of the esters contain from 2 to 26 carbon atoms. Preferred esters are carboxylic acid esters of mannitol and sorbitol and are useful as emulsifying agents. Particularly preferred esters are the mono- and di-stearoyl and palmitoyl esters of sorbitol and mannitol. The novel esters are prepared by reacting a carboxylic acid or a lower alkyl ester of a carboxylic acid with an ketalized linear aliphatic polyatomic alcohol in the presence of an alkaline catalyst to form a carboxylic acid ester of the ketalized alcohol and thereafter hydrolyzing the ketal of the ester to form hydroxyl groups at the terminal carbon atom. The hydrolysis is preferably accomplished by acid.

3,579,548

TRIGLYCERIDE ESTERS OF α-BRANCHED CARBOXYLIC ACIDS

David D. Whyte, Wyoming, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed May 10, 1968, Ser. No. 728,362

Int. Cl. C11c *3/02*; A23d *3/00*

U.S. Cl. 260—410.7 1 Claim

Glycerol esters of α-branched carboxylic acids have the physical properties and utility, e.g., in food compositions, of ordinary triglyceride fat but are less digested or absorbed and are thus low calorie.

3,579,549

ACYL DERIVATIVES OF THE CONDENSATION POLYMERS OF ALPHA-HYDROXY-PROPIONIC ACID WITH BETA-HYDROXYBUTYRIC ACID AND/OR BETA-HYDROXYPROPIONIC ACID

Hans H. Stockmann, Plainfield, Dilip K. Ray-Chaudhuri, Somerset, and Richard M. Boettger, Morristown, N.J., assignors to National Starch and Chemical Corporation, New York, N.Y.

No Drawing. Filed Sept. 29, 1967, Ser. No. 671,566

Int. Cl. A21d *2/16*; C11c *3/04*

U.S. Cl. 260—410.9R 14 Claims

Acyl derivatives of the condensation polymers of alpha-hydroxypropionic acid with beta-hydroxybutyric acid and/or beta-hydroxypropionic acid, as well as the alkali metal, alkaline-earth metal and ammonium salts thereof; the latter derivatives serving as food emulsifiers and as shortening aids. A process for preparing baked goods as well as the baked goods resulting therefrom, said process comprising the incorporation of the above specified derivatives into the raw dough mix prior to the baking thereof. The resulting baked goods are characterized by their prolonged retention of freshness, fine texture, good color and substantial volume.

3,579,550

OXYGENATED DERIVATIVES OF ACYCLIC OLEFINS

Edouard P. Demole, Geneva, Switzerland, assignor to Firmenich & Cie, Geneva, Switzerland

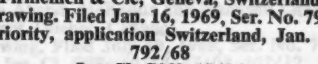
No Drawing. Filed Jan. 16, 1969, Ser. No. 791,770

Claims priority, application Switzerland, Jan. 17, 1968, 792/68

Int. Cl. C08h *17/36*

U.S. Cl. 260—413 7 Claims

Compounds having the formula



wherein a double bond is located in one of the positions indicated by the dotted lines and wherein R represents a —COOH or —CH_2OH group and *n* stands for the integer 1 or 2; and methods for manufactuing the said compounds which are useful as fragrances and fixatives in the perfume industry.

3,579,551

PRODUCTION OF CARBOXYLIC ACIDS

John H. Craddock, Ballwin, and Arnold Hershman, Creve Coeur, Mo., Frank E. Paulik, Houston, Tex., and James F. Roth, Creve Coeur, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Aug. 15, 1968, Ser. No. 752,795

Int. Cl. C08h *17/36*

U.S. Cl. 260—413 27 Claims

The present invention relates to a process for the preparation of carboxylic acids, specifically by the reaction

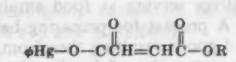
of ethylenically unsaturated compounds with carbon monoxide and water, in the presence of catalyst compositions essentially comprising iridium compounds and complexes, together with an iodide promoter.

3,579,552
PRODUCTION OF CARBOXYLIC ACIDS
John H. Craddock, Ballwin, and Arnold Hershman, Creve Coeur, Mo., Frank E. Paulik, Houston, Tex., and James F. Roth, Creve Coeur, Mo., assignors to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Aug. 15, 1968, Ser. No. 752,746
Int. Cl. C08h *17/36*
U.S. Cl. 260—413 **25 Claims**

The present invention relates to a process for the preparation of carboxylic acids, specifically by the reaction of ethylenically unsaturated compounds with carbon monoxide and water, in the presence of catalyst compositions essentially comprising rhodium compounds and complexes, together with an iodide promoter.

3,579,553
PHENYLMERCURY COMPOUNDS
John R. Leebrick, Old Lyme, Conn., assignor to Cosan Chemical Corporation, Clifton, N.J.
No Drawing. Filed Aug. 21, 1968, Ser. No. 754,490
Int. Cl. C07f *3/12*
U.S. Cl. 260—434 **5 Claims**

Novel compounds are provided of the formula



wherein R is an aliphatic or cyclic alkyl radical, aralkyl radical or aliphatic alkenyl radical. These compounds are useful as catalysts for making polyurethanes, and also act antimicrobially in the polyurethanes, and as antimicrobial agents for coating compositions, including common and marine paints and coatings, and for turf and seeds and as marine antifouling agents and as preservatives. The term "antimicrobial" as employed herein includes "cidal" and static control of bacteria, yeasts, fungi and the like.

3,579,554
DESLUDGING TEL WITH OXYGENATED WATER
Jean Claude Boudreau, Landenburg, Pa., assignor to E. I. du Pont de Nemours and Company
Filed Oct. 31, 1968, Ser. No. 772,339
Int. Cl. C07f *7/26*
U.S. Cl. 260—437 **9 Claims**

A process for purifying impure tetraethyllead by mixing said impure tetraethyllead with water containing dissolved oxygen thereby converting the impurities into a sludge phase.

3,579,555
CHROME COMPLEXES OF SUBSTITUTED BENZOIC ACID
William J. Pangonis, West Chester, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Feb. 3, 1969, Ser. No. 796,224
Int. Cl. C07f *11/00;* **C23c** *3/00*
U.S. Cl. 260—438.5 **3 Claims**

This invention relates to novel chrome complexes of benzoic acid. These complexes are exemplified by p-sulfamylbenzoic acid chrome complex and p-acetamidobenzoic acid chrome complex.

3,579,556
NICKEL KETOXIME CHELATES
Peter James Briggs and Ronald James Hurlock, Manchester, England, assignors to Imperial Chemical Industries Limited, London, England
No Drawing. Filed June 21, 1968, Ser. No. 738,839
Claims priority, application Great Britain, June 26, 1967, 29,427/67
Int. Cl. C07j *15/04;* **C08j** *45/62*
U.S. Cl. 260—439R **4 Claims**

Nickel chelate complexes of syn-alkyl 2-hydroxyaryl ketoximes in which the alkyl group contains at least 6 carbon atoms are used as light stabilisers for polymers, especially polyolefins. The chelate complexes are prepared from the syn-alkyl 2-hydroxyaryl ketoximes by reacting with a solution of a nickel salt.

3,579,557
WATER AND OIL REPELLENTS
Thomas W. Brooks and Paul D. Schuman, Gainesville, and Calvin D. Padgett, Waldo, Fla., assignors to Calgon Corporation, Pittsburgh, Pa.
No Drawing. Filed Aug. 21, 1968, Ser. No. 754,457
Int. Cl. C07f *7/10*
U.S. Cl. 260—448.2N **3 Claims**

Certain fluorosilazanes and chlorosilanes are disclosed. The new compounds are of the formulas

in which x is 0–10 and R_1 and R_2 are independently selected alkyl groups. They are useful as oil and water repellents and as derivatizing agents to facilitate gas-liquid chromatographic analyses.

3,579,558
PROCESS FOR THE PRODUCTION OF ω-AMINOALKANE NITRILES
Otto Immel, Krefeld-Uerdingen, Hans-Helmut Schwarz, Krefeld-Bockum, and Hermann Schnell, Krefeld-Uerdingen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Sept. 25, 1968, Ser. No. 762,630
Claims priority, application Germany, Oct. 14, 1967, F 53,775, F 53,776
Int. Cl. C07c *121/02*
U.S. Cl. 260—465.2 **5 Claims**

Process of producing ω-aminoalkane nitriles by heating corresponding lactams with a stoichiometric excess of ammonia in the gaseous phase in the presence of a catalytic amount of a solid catalyst, said catalyst consisting essentially of magnesium silicate, calcium silicate, zinc silicate, aluminum silicate, manganese silicate, iron silicate, fluorinated aluminum oxide, fluorinated magnesium silicate, fluorinated calcium silicate, fluorinated zinc silicate, fluorinated aluminum silicate, fluorinated manganese silicate or fluorinated iron silicate.

3,579,559
PREPARING MUCONONITRILE FROM BENZENE
Manfred Otto Unger, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed May 29, 1968, Ser. No. 732,873
Int. Cl. C07c *121/02*
U.S. Cl. 260—465.3 **4 Claims**

Vapor phase reaction of benzene with ammonia and oxygen at above 300° C. to produce muconononitrile.

3,579,560

ISOMERIZATION OF NITRILES

William Charles Drinkard, Jr., Wilmington, Del., and Brian W. Taylor, Pittsburgh, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 680,969, Nov. 6, 1967. This application Oct. 28, 1968, Ser. No. 771,313

Int. Cl. C07c *121/30*

U.S. Cl. 260—465.9 20 Claims

Process of isomerizing 2-methyl-3-butenenitrile to 3-pentenenitriles and 3-pentenenitriles to 4-pentenenitrile using a compound of cobalt or rhodium in conjunction with an oxidizing agent or reducing agent present in an amount such that the cobalt or rhodium has an effective valence below +2 and generally of from 0.25 to 1.75 as catalyst and of adding hydrogen cyanide to carbon-carbon double bonds such as in 4-pentenenitrile at from —25 to 200° C. using the same cobalt or rhodium catalyst system.

3,579,561

HYDROXYBENZYL-SUBSTITUTED BIS-PHENYL CARBONATES

Bernard R. Meltsner, Royal Oak, Mich., assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Filed July 9, 1965, Ser. No. 470,890

Int. Cl. C07c *69/00*

U.S. Cl. 260—463 10 Claims

Hydroxybenzylphenyl carbonates and carboxylates are useful as stabilizers for organic material. They may be used alone or in combination with a dihydrocarbylthiodialkanoate.

3,579,562

PROCESS FOR HYDROFORMYLATING UNSATURATED ESTERS OR NITRILES

Wolfgang Weigert, Offenbach am Main, Germany, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

No Drawing. Filed Dec. 17, 1965, Ser. No. 514,648

Claims priority, application Germany, Dec. 22, 1964, D 46,116; May 22, 1965, D 47,334

Int. Cl. C07c *121/34, 69/66*

U.S. Cl. 260—465.1 14 Claims

Methacrylic acid esters and nitrile are hydroformylated in the presence of a rhodium catalyst. α-formyl products predominate when reacting below 100° C. and β-formyl products predominate when reacting above 100° C.

3,579,563

PROCESS FOR THE HYDROGENATION OF MIXED NAPHTHALENE ESTERS AND COMPOSITIONS DERIVED THEREFROM

Philip W. Storms, Denver, and Grover L. Farrar, Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

No Drawing. Filed Mar. 2, 1967, Ser. No. 619,950

Int. Cl. C07c *69/76*

U.S. Cl. 260—468 12 Claims

Hydrogenated derivatives of dimethylnaphthalenes are prepared by

(a) cracking a gas oil to form a light catalytic cycle oil having a boiling range between about 300 to 700° F.,

(b) hydrotreating said light catalytic cycle oil at temperatures of from about 600 to about 800° F. and pressures of from about 200 to about 1000 p.s.i.a. to form a hydrotreated cycle oil,

(c) extracting at least a portion of the aromatics from said hydrotreated cyclic oil,

(d) separating the extracted aromatics from the extracting solvent,

(e) oxidizing the extracted aromatics,

(f) hydrogenating the aromatics.

3,579,564

ESTERS OF 5-HYDROXYTETRACYCLINES

Robert K. Blackwood and Manfred Schach von Wittenau, Gales Ferry, Conn., assignors to Chas. Pfizer & Co., Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 439,974, Mar. 15, 1966. This application Feb. 3, 1969, Ser. No. 796,202

Int. Cl. C07c *103/19, 139/76;* C07d *5/20*

U.S. Cl. 260—473 15 Claims

Esters of oxytetracyclines including O^{12a}-esters of oxytetracycline, α- and β-6-deoxy-oxytetracycline, 6-demethyl-6-deoxy-6-methyleneoxytetracycline, the mercaptan adducts of the latter compound and acid addition and metal salts of said esters and their utility as antibacterial agents and as intermediates in the preparation of other biologically active compounds.

3,579,565

SULFONATE MONOMERS

Joel A. Zaslowsky and Henry Gould, Baltimore, Md., assignors to Alcolac Chemical Corporation, Baltimore, Md.

No Drawing. Filed June 12, 1967, Ser. No. 645,493

Int. Cl. C07c *69/54, 69/60*

U.S. Cl. 260—485 3 Claims

A new class of sulfonate monomers, both as new compositions of matter, and homopolymers and copolymers containing them.

3,579,566

REDUCTION OF ANHYDRIDES

Donald M. Fenton, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

No Drawing. Filed Dec. 13, 1967, Ser. No. 690,067

Int. Cl. C07c *47/06, 69/16, 67/00*

U.S. Cl. 260—488 10 Claims

A process for reduction of organic acid anhydrides comprising reacting the anhydride with hydrogen in the presence of a catalyst comprising a complex of a Group VIII noble metal with a biphyllic ligand from the group consisting of organic phosphines, organic arsines and organic stibines.

3,579,567

TRICYCLO[4.4.0.$0^{3,8}$]DECAN-1-AMINE AND PROCESS FOR PREPARING SAME

Pierre Deslongchamps, Sherbrooke, Quebec, Canada, assignor to Ayerst, McKenna and Harrison Limited, Ville St. Laurent, Quebec, Canada

No Drawing. Filed July 10, 1968, Ser. No. 743,623

Int. Cl. C07c *69/14, 87/02, 103/32*

U.S. Cl. 260—488 10 Claims

There is disclosed herein tricyclo[4.4.0.$0^{3,8}$]decan-1-amine and the intermediates used in this preparation 8-hydroxytricyclo[4.4.0.$0^{3,8}$]decan-4-one acetate, 8-hydroxytricyclo[4.4.0.$0^{3,8}$]decan-4-one acetate thioketal, tricyclo [4.4.0.$0^{3,8}$]decan-1-ol acetate, tricyclo[4.4.0.$0^{3,8}$]decan-1-ol, and N-1-tricyclo[4.4.0.$0^{3,8}$]decanylacetamide. The compound possesses anti-viral properties, and methods for its use as well as a process for its preparation are also disclosed.

3,579,568

SYNTHESIS OF CARBOXYLIC ACIDS FROM ETHYLENE AND CARBON MONOXIDE AND NOBLE METAL COMPOUNDS

Richard F. Heck, Wilmington, and Patrick M. Henry, McDaniel Crest, Del., assignors to Hercules Powder Company, Wilmington, Del.

No Drawing. Original application Aug. 18, 1965, Ser. No. 480,809. Divided and this application Jan. 16, 1969, Ser. No. 791,789

Int. Cl. C07c *67/04*

U.S. Cl. 260—497 4 Claims

The disclosed process is a method for producing carboxylic acids by carbonylation of olefinic hydrocarbons.

An olefin such as ethylene, and water or an acid such as acetic acid, are brought into contact with carbon monoxide in the presence of a compound of a Group VIII noble metal such as palladium at a temperature in the range of 25° to 250° C. Using ethylene and acetic acid as reactants, the product contains β-acetoxypropionic acid. A redox agent such as cupric chloride may be used to effect regeneration of the noble metal compound.

3,579,569
PREPARATION OF VINYL ACETATE

Stewart R. Montgomery, Silver Spring, and Melville E. Hillmann, Rockville, Md., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Filed Oct. 6, 1967, Ser. No. 673,297
Int. Cl. C07c *67/04*
U.S. Cl. 260—497 **4 Claims**

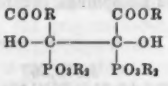
Vinyl acetate is produced by reacting ethylene and acetic acid in the vapor phase in the presence of a novel catalyst. The catalyst is solid titanium dioxide which has been treated with an aqueous solution of a basic material and with a solution of a soluble salt of a Group VIII noble metal. The Group VIII noble metal salt which deposited on the surface of the titanium dioxide is subsequently reduced to the metallic state with hydrogen.

3,579,570
ETHANE-1,2 - DICARBOXY - 1,2-DIHYDROXY-1,2-DIPHOSPHONIC ACID, LOWER ALKYL ESTERS, ALKALI METAL SALTS THEREOF AND PROCESS FOR PREPARING SAME

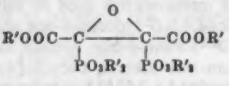
Denzel Allan Nicholson, Springfield Township, Hamilton County, Ohio, and Darrel Campbell, King of Prussia, Pa., assignors to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed Dec. 24, 1968, Ser. No. 786,765
Int. Cl. C07f *9/38*; C11d *3/08*
U.S. Cl. 260—502.4 **8 Claims**

Compounds having the formula



in which R is hydrogen, alkali metal, or an alkyl group having from 1 to about 6 carbon atoms, ammonium or alkanolammonium having 1 to 3 carbon atoms in each alkanol group by a process which comprises reacting an ester of ethane-1,2-dicarboxy-1,2-diphosphonic acid with an alkali metal hypohalite to form an epoxide compound having the formula



in which R' is an alkyl group having from 1 to about 6 carbon atoms, and hydrolyzing said epoxide. The compounds are useful as detergency builders, sequestering agents and anti-calculus agents in oral compositions.

3,579,571
PROCESS FOR THE PREPARATION AND ISOLATION OF DEHYDROABIETIC ACID

Noah J. Halbrook and Ray V. Lawrence, Olustee, Fla., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Nov. 13, 1967, Ser. No. 682,541
Int. Cl. C07c *61/30*
U.S. Cl. 260—514.5 **6 Claims**

Dehydroabietic acid is separated from rosin, other rosin acids, and rosin materials either present in rosin or formed in the disproportionation of rosin, by forming the 2-aminoethanol salt of dehydroabietic acid and recovering the pure acid from the amine salt.

3,579,572
PROCESS FOR THE PRODUCTION OF TEREPHTHALIC ACID

Garabed Amedjian, Maurice Fenoglio, and Michel Oberdorf, Lyon, France, assignors to Rhone-Poulenc S.A., Paris, France

No Drawing. Filed Jan. 5, 1968, Ser. No. 695,879
Int. Cl. C07c *63/26*
U.S. Cl. 260—515 **6 Claims**

Terephthalic acid is produced by treating aqueous lithium or magnesium terephthalate solution with carbon dioxide under pressure, and separating the precipitated terephthalic acid.

3,579,573
OXIDATION OF α,β-UNSATURATED ALDEHYDES TO THE CORRESPONDING UNSATURATED CARBOXYLIC ACIDS

Dieter Gilde, Hanau am Main, and Edgar Koberstein, Konstanz, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

No Drawing. Filed Jan. 20, 1964, Ser. No. 338,610
Claims priority, application Germany, Jan. 29, 1963, D 40,744; Dec. 23, 1963, D 43,244
Int. Cl. C07c *51/26*
U.S. Cl. 260—530 **6 Claims**

Process for the production of α,β-unsaturated carboxylic acid by catalytic oxidation of α,β-unsaturated aldehydes in the gas phase with molecular oxygen using a mixture of phosphoric acid and vanadic acid in which the atomic ratio of phosphorus to vanadium is from 1:10 to 10:1 which may also contain antimony trioxide as oxidation catalyst.

3,579,574
PRODUCTION OF ACRYLIC ACID

Wilhelmus Teunis van der Meer, London, England, assignor to The Distillers Company Limited, Edinburgh, Scotland

No Drawing. Filed Jan. 22, 1965, Ser. No. 427,502
Claims priority, application Great Britain, Feb. 5, 1964, 4,804/64
Int. Cl. C07c *51/26, 51/32*
U.S. Cl. 260—530 **11 Claims**

Acrylic acid is prepared by the vapor phase oxidation of propylene or acrolein with oxygen in the presence of a catalyst consisting essentially of an oxide composition containing antimony and vanadium or antimony, vanadium and at least one polyvalent metal selected from the group of iron, manganese, chromium, cobalt, nickel, copper, zinc, cadmium, tungsten and thorium, the catalyst being heated to a temperature above 700° to about 900° C. in molecular oxygen gas before use.

3,579,575
PROCESS FOR OXIDIZING LOWER ALIPHATIC ALDEHYDES

Albert Bouniot, Melle, Deux-Sevres, France, assignor to Melle-Bezons, Melle, Deux-Sevres, France

No Drawing. Filed May 8, 1968, Ser. No. 727,705
Claims priority, application France, May 26, 1967, 107,982
Int. Cl. C07c *53/22*
U.S. Cl. 260—530 **14 Claims**

Process for oxidizing lower aliphatic aldehydes wherein the oxidation is carried out by passage of an oxygen containing gas through a liquid medium containing the aldehyde, in which the liquid medium comprises heterogeneous liquid phases, one of which is an aqueous phase.

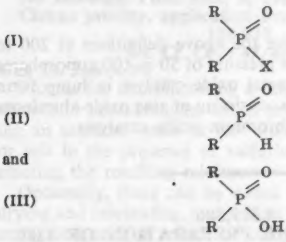
3,579,576

ORGANOPHOSPHORUS COMPOUNDS AND A PROCESS FOR THE MAKING THEREOF

Howard P. Angstadt, Wilmington, Del., assignor to Sun Oil Company, Philadelphia, Pa.

No Drawing. Filed Feb. 25, 1964, Ser. No. 347,105
Int. Cl. C07f *9/34, 9/30*
U.S. Cl. 260—543P 19 Claims

Compounds of the structure



where the R's are alkyl or cycloalkyl groups and X is halogen. Process of preparing these compounds from white phosphorus and an alkyl halide or cycloalkyl halide in a solvent such as carbon disulfide at from —80° C. to 100° C. in the presence of any of $AlCl_3$, $AlBr_3$, BF_3 $FeCl_3$ or $TiCl_4$ as catalyst followed by hydrolyzing the thus formed product with water at from 0° to 50° C. to produce the final product which is then separated from the reaction medium. When the alkyl or cycloalkyl halide is primary or secondary compounds of structures II and III as set forth above are formed and when tertiary alkyl or cycloalkyl halides are used compounds of structures I and II are formed.

3,579,577

METHOD OF PREPARING 4,5,6, HEXACHLOROTOLUYL CHLORIDE

Paul E. Hoch, Youngstown, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 818,517, June 8, 1959. This application Oct. 29, 1962, Ser. No. 233,885
Int. Cl. C07c *51/58*
U.S. Cl. 260—544 2 Claims

4,5,6,α,α,α-hexachlorotoluyl chloride is prepared by heating 3,4,5,6,7,7-hexachloro-3,6-menthano-1,2,3,6-tetrahydrophthaloyl chloride to at least 180° C. The toluyl chloride so produced is a useful chemical intermediate for making dyestuffs, herbicides, flame retardants and flameproofing agents.

3,579,578

3,4-DIHALO-3′ AND 4′-LOWER ALKYLCARBANILIDES

Edward J. Nikawitz, Glen Rock, and George R. Walter, Ho-Ho-Kus, N.J., assignors to Givaudan Corporation, Clifton, N.J.

No Drawing. Filed July 8, 1966, Ser. No. 563,673
Int. Cl. C07c *127/00*
U.S. Cl. 260—553 10 Claims

The present invention relates to novel 3,4-dihalo-3′- and 4′-lower alkyl carbanilides having bacteriostatic activity, a process for their manufacture, bacteriostatic compositions containing these compounds, synergistic basteriostatic compositions of the new compounds with hexachlorophene, and a method for controlling bacteria by the use of said compounds.

ERRATUM

For Class 260—555 see:
Patent No. 3,579,636

3,579,579

SUBSTITUTED 7- AND/OR 9-AMINO-6-DEMETHYL-6-DEOXYTETRACYCLINES

Joseph J. Hlavka, Tuxedo, Panayoto Bitha, New York, and Adma Schneller Ross and Michael Joseph Martell, Suffern, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Apr. 18, 1968, Ser. No. 722,167
Int. Cl. C07c *103/19*
U.S. Cl. 260—559 2 Claims

This disclosure describes compounds of the class of 7- or 9-di(lower alkyl)amino-6-demethyl-6 - deoxytetracycylines and 7-monoalkylamino - 6 - demethyl-6-deoxytetracyclines useful as antibacterial agents.

3,579,580

PROCESS FOR PREPARING 1,4-BENZODIAZEPINES

Giles A. Archer, Essex Fells, and Leo Henryk Sternbach, Upper Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed July 26, 1966, Ser. No. 567,827
Int. Cl. C07c *119/00*
U.S. Cl. 260—566 5 Claims

Preparation of 1,4-benzodiazepines via the reaction of 2 - (2 - amino - 5 -Y-α-phenylbenzylideneamino)ethanol wherein Y is selected from the group consisting of halogen, nitro, trifluoromethyl and hydrogen with a leaving group providing agent, e.g. thionyl chloride whereby to obtain the novel corresponding 2-(2-amino-5-Y-α-phenylbenzylideneamino)ethyl X wherein X is a leaving group and ring closing the last-mentioned compound whereby to obtain a 1,4-benzodiazepine. 1,4-benzodiazepines are known compounds of pharmacological utility, and are useful as anticonvulsant, muscle relaxant and sedative agents.

3,579,581

PREPARATION OF QUATERNARY AMMONIUM HYDROXIDES

Jim N. Maloney, Jr., Pensacola, and Ralph W. Smith, Gulf Breeze, Fla., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 711,200, Mar. 7, 1968. This application Apr. 3, 1968, Ser. No. 718,362
Int. Cl. C07c *85/00*
U.S. Cl. 260—567.6 6 Claims

Quaternary ammonium hydroxides can be prepared in high yield and purity from quaternary ammonium salts in the aqueous residue from extraction of an olefinic nitrile electrohydrodimerization effluent by contacting at least a portion of the aqueous residue with a basic anion exchange resin.

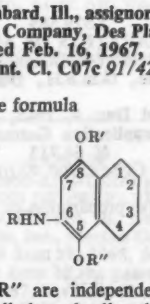
3,579,582

HYDROXY AND/OR HYDROCARBYLOXY AND AMINO SUBSTITUTED TETRAHYDRONAPHTHALENES

Ted Symon, Lombard, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Feb. 16, 1967, Ser. No. 616,474
Int. Cl. C07c *91/42*
U.S. Cl. 260—574 8 Claims

Compounds of the formula



where R, R′ and R″ are independently selected from hydrogen, alkyl, aralkyl, aryl, alkaryl or cycloalkyl. The compounds are useful as stabilizing additives in organic substrates such as lube oils, greases and polyolefin plastics.

3,579,583
PROCESS FOR PREPARATION OF N-METHYL-ALKYL AMINES

Horst Rutzen, Dusseldorf-Holthausen, Germany, assignor to Henkel & Cie., G.m.b.H., Dusseldorf-Holthausen, Germany

No Drawing. Filed Dec. 9, 1968, Ser. No. 782,426
Claims priority, application Germany, Dec. 7, 1967, H 64,693
Int. Cl. C07c *85/12*
U.S. Cl. 260—583 10 Claims

A new method of producing N-methyl-alkyl amines by hydrogenating a monocarboxylic acid or a dicarboxylic acid which will not form an internal anhydride at 200 to 400° C. in the presence of mono and/or dimethyl amine and an oxide catalyst.

3,579,584
PREPARATION OF AMINES

Horst Rutzen and Rolf Brockmann, Dusseldorf-Holthausen, Germany, assignors to Henkel & Cie, G.m.b.H., Dusseldorf, Germany

No Drawing. Filed Dec. 9, 1968, Ser. No. 782,427
Claims priority, application Germany, June 11, 1968, P 17 68 641.8
Int. Cl. C07c *85/00, 85/02, 85/12*
U.S. Cl. 260—583 9 Claims

A process for the preparation of amines having the formula

(I)

wherein R_1 and R_2 are selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms and R is selected from the group consisting of saturated and unsaturated straight and branch aliphatic and cycloaliphatic of 4 to 24 carbon atoms and aromatic of 6 to 24 carbon atoms which may be substituted with one

which comprises reacting a carboxylic acid ester in one step with a nitrogen compound of the formula

at a temperature of 200 to 400° C. in the presence of hydrogen which may be diluted with a reaction-insert gas at a pressure of 50 to 400 atmospheres and in the presence of a metal oxide catalyst in lump form selected from the group consisting of zinc oxide-chromium oxide and zinc oxide-aluminum oxide catalysts.

3,579,585
PREPARATION OF AMINES

Horst Rutzen, Dusseldorf-Holthausen, Germany, assignor to Henkel & Cie., G.m.b.H., Dusseldorf-Holthausen, Germany

No Drawing. Filed Dec. 9, 1968, Ser. No. 782,480
Claims priority, application Germany, Dec. 8, 1967, H 64,713
Int. Cl. C07c *85/00, 85/02, 85/12*
U.S. Cl. 260—583 11 Claims

A process for the preparation of aliphatic amines of the formula

wherein R is selected from the group consisting of saturated and unsaturated aliphatic radicals of 6 to 22 carbon atoms and R_1 and R_2 are selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms which comprises reacting a fatty acid glyceride having an R radical with a nitrogen compound of the formula

wherein R_1 and R_2 have the above definitions at 200 to 400° C. and a hydrogen pressure of 50 to 400 atmospheres in the presence of a metal oxide catalyst in lump form selected from the group consisting of zinc oxide-aluminum oxide and zinc oxide-chromium oxide catalysts.

3,579,586
PROCESS FOR THE PREPARATION OF THE DEXTROROTATORY 2,2' - (ETHYLENE-DI-IMINO)-DI-1-BUTANOL

Giorgio Zoja, Milan, Italy, assignor to Laboratorio Chimico Farmaceutico Giorgio Zoja S.p.A., Milan, Italy

No Drawing. Filed Nov. 13, 1968, Ser. No. 775,508
Claims priority, application Germany, June 5, 1968, P 17 68 612.3
Int. Cl. C07c *89/04*
U.S. Cl. 260—584R 7 Claims

A process for the production of highly pure, levoisomer free, (+) 2,2-ethylenediimino-di-1-butanol dihydrochloride involving resolution of (±) 2-amino-1-butanol (+) tartrates with boiling methanol, reaction of (+) 2-amino-1-butanol with ethylene dichloride and precipitating the intermediate product with gaseous hydrochloric acid to obtain the desired product.

3,579,587
PROCESS FOR THE PREPARATION OF THE DEXTROROTATORY 2,2' - (ETHYLENE-DI-IMINO)-DI-1-BUTANOL

Giorgio Zoja, Milan, Italy, assignor to Laboratorio Chimico Farmaceutico Giorgio Zoja S.p.A., Milan, Italy

No Drawing. Filed Nov. 13, 1968, Ser. No. 775,536
Claims priority, application Great Britain, Apr. 18, 1968, 18,491/68
Int. Cl. C07c *89/00*
U.S. Cl. 260—584 8 Claims

A process for the production of pure (+)2,2'-(ethylenediimino)-di-1-butanol dihydrochloride formed by reacting a solution of (+)2-amino-1-butanol and (−)2-amino-1-butanol with (+)tartaric acid, separating the diastereoisomers by fractional crystallization using boiling methyl alcohol and reacting the highly pure (+)2-amino-1-butanol (+)hydrogen tartarate with ethylene dichloride in the presence of an inert organic solvent and a calcium compound, concentrating the reaction solution, removing insoluble calcium salts and saturating with gaseous HCl to precipitate (+)2,2'-(ethylenediimino)-di-1-butanol dihydrochloride.

3,579,588
6,6,7,7-TETRACHLOROBICYCLO(3.2.0) HEPTAN-2-ONE

Wendell L. Dilling, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed July 24, 1968, Ser. No. 747,116
Int. Cl. C07c *49/00*; B01j *1/10*
U.S. Cl. 260—586 1 Claim

The present disclosure is directed to the compound 6,6,7,7-tetrachlorobicyclo(3.2.0)heptan-2-one, its method of preparation as well as its use as a bactericide and fungicide.

3,579,589

PROCESS FOR MANUFACTURING A CATALYST, RESULTING CATALYST AND PROCESS FOR MANUFACTURE OF BENZOIC ALDEHYDE FROM TOLUENE IN THE PRESENCE OF SAID CATALYST

Bernard Delmon, Seyssins, France, assignor to Institut Francais du Petrole des Carburants et Lubrifiants, Rueil Malmaison, France

No Drawing. Filed Sept. 5, 1968, Ser. No. 757,755
Claims priority, application France, Sept. 13, 1967, 120,933
Int. Cl. C07c *47/48, 47/52*
U.S. Cl. 260—599 19 Claims

Process for manufacturing a catalyst used for oxidizing toluene to benzaldehyde, which process comprises admixing an uranium oxide or salt with a molybdenum oxide or salt in the presence of sulfuric acid, drying and calcinating the resulting mixture.

Optionally, there can be added to the mixture, before drying and calcinating, an alkaline or alkaline-earth metal compound and/or metals or compounds of metals such as chromium, tungsten, silver, copper, yttrium, cerium and other elements from the group of the rare earths.

3,579,590

METHOD OF PREPARING DIARYL SULFONES

David S. Davis, West Orange, N.J., assignor to Witco Chemical Corporation, New York, N.Y.

No Drawing. Filed Dec. 12, 1967, Ser. No. 689,809
Int. Cl. C07c *147/06*
U.S. Cl. 260—607 5 Claims

Production of diaryl sulfones having the formula

$$R—SO_2—R$$

by reacting in admixture (a) aryl compounds having the formula RH wherein R represents an aryl hydrocarbon such as benezne or naphthalene in which the nuclear carbon atoms have their outer valences satisfied by hydrogen or one or more of alkyl (including cycloalkyl), alkoxy, thioalkyl, halogen, phenyl, substituted phenyl, phenoxy, and substituted phenoxy groups and mixtures thereof (b) anhydrous sulfonating agents as, for instance, fluorosulfonic acid, sulfur trioxide, chlorosulfonic acid and mixtures thereof, and (c) at least 0.04 mole of a non-metallic condensing agent for instance, P_2O_5, phosphorus pentachloride, phosphorus oxychloride, and boric anhydride, per mole of sulfonating agent, said diaryl sulfones being produced in high yield and having a high degree of purity, free from metallic impurities.

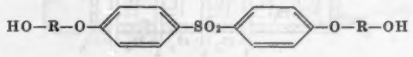
3,579,591

4,4'-BIS-(HYDROXYARLOXY)-PHENYLSULFONE

Hermann Schnell and Gerhard Darsow, Krefeld-Uerdingen, and Ludwig Bottenbruch, Krefeld-Bockum, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Continuation-in-part of application Ser. No. 620,233, Mar. 3, 1967. This application Oct. 8, 1968, Ser. No. 765,993
Claims priority, application Germany, Mar. 18, 1966, F 53,836
Int. Cl. C07c *142/10, 51/00;* C08a *22/14*
U.S. Cl. 260—607 5 Claims

Aryl ethers of the formula



wherein R is a bivalent aromatic radical and the utility thereof as intermediates for reaction with carboxylic acid halides, dicarboxylic acid dihalides, isocyanates and polyisocyanates to produce, respectively, diesters, polyesters, diurethanes and polyurethanes. The aforesaid ethers are prepared by reacting 1 mol of 4,4'-dihalo-diphenylsulphone with about 2 mols diphenolate at a temperature between about 100 and 160° C. and acidifying resulting product.

3,579,592

1-ALLYLTHIO-3-CHLORO-2-PROPANOL

Leonard Levine, Lake Jackson, and Russell T. McFadden, Freeport, Tex., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Oct. 22, 1968, Ser. No. 769,706
Int. Cl. C07c *149/18;* A61k *27/00;* C08f *15/00*
U.S. Cl. 260—609 4 Claims

1-allylthio-3-halo-2-propanol is made by reacting an allyl halide with 1-mercapto-3-halo-2-propanol, wherein the halogen in each reactant has an atomic weight of at least 35, in the presence of a hydrogen halide acceptor. The compound is used as an anthelmintic.

3,579,593

PROCESS FOR PREPARING BETA-PHENYLETHYL ALCOHOL

Thomas F. Wood, Wayne, N.J., assignor to Givaudan Corporation, Clifton, N.J.

No Drawing. Filed Apr. 18, 1968, Ser. No. 722,224
Int. Cl. C07c *29/00*
U.S. Cl. 260—618 6 Claims

β-Phenylethyl alcohol suitable for perfumery use is prepared in excellent yields by the hydrogenation of styrene oxide in the presence of the two catalysts: Raney nickel and palladium, and fractionally distilling the alcohol.

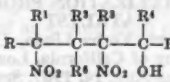
3,579,594

PREPARATION OF DINITRO ALCOHOLS

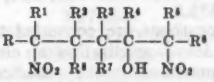
John M. Larkin, Hopewell Junction, N.Y., assignor to Texaco Inc., New York, N.Y.

No Drawing. Filed Nov. 30, 1967, Ser. No. 686,820
Int. Cl. C07c *79/18, 87/04*
U.S. Cl. 260—632 14 Claims

A method for preparing dinitro alcohols having at least 4 carbon atoms by heating a vicinal nitroalkyl nitrate having at least 4 carbon atoms at a temperature of at least 100° C. The dinitro alcohols so prepared correspond to the formulas:



and



and are useful as solvents, plasticizers, bactericides, lubricants and fuel additives.

3,579,595

1-BROMO-1-CHLORO-2,3,3-TRIFLUOROPROPENE AND METHOD OF PREPARING SAME

Bernard M. Regan, Chicago, Ill., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.

No Drawing. Filed Jan. 19, 1968, Ser. No. 699,060
The portion of the term of the patent subsequent to Mar. 3, 1987, has been disclaimed
Int. Cl. C07c *17/34, 21/18*
U.S. Cl. 260—653.3 2 Claims

1-bromo-1-chloro-2,3,3-trifluoropropene, useful as a general anesthetic.

3,579,596

HYDROGENOLYSIS OF CARBON TETRACHLORIDE AND CHLOROFORM

Charles R. Mullin and C. Elmer Wymore, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Mar. 29, 1968, Ser. No. 717,383
Int. Cl. C07c *17/06*
U.S. Cl. 260—658 12 Claims

A process for the selective vapor phase dechlorination of carbon tetrachloride and chloroform, resulting in lower chlorinated methanes, which comprises:

(A) Reacting carbon tetrachloride with an excess of hydrogen, at a temperature below 200° C. and a liquid hourly space velocity of 0.1 to 10, in the presence of a catalyst chosen from the metals Ru, Rh, Pd, Os, Ir, Pt, Cu, Ag, or Au, to produce predominantly chloroform; or

(B) Reacting carbon tetrachloride with an excess of hydrogen, at a temperature of 125° to 350° C. and a liquid hourly space velocity of 0.5 to 10, in the presence of one of the catalysts of (A) above, to produce predominantly methylene chloride; or

(C) Reacting chloroform with an excess of hydrogen, at a temperature of 75° to 350° C. and a liquid hourly space velocity of 0.1 to 10, in the presence of one of the catalysts of (A) above, to produce predominantly methylene chloride.

3,579,597

PREPARATION OF C_2 SATURATED CHLORINATED COMPOUNDS BY OXYCHLORINATION OF ETHYLENE AND VINYL CHLORIDE WITH A FLUID BED CATALYST

Albert Antonini and Philippe Joffre, Paris, and Claude Vrillon, Montmagny, France, assignors to Produits Chimiques Pechiney-Saint-Gobain, Paris, France

No Drawing. Filed May 20, 1968, Ser. No. 730,611
Claims priority, application France, May 19, 1967, 106,971
Int. Cl. C07c *17/06*
U.S. Cl. 260—658R 16 Claims

A process for the preparation of 1,2-dichloroethane, 1,1,2-trichloroethane, 1,1,2,2-tetrachloroethane and pentachloroethane simultaneously by oxychlorination of ethylene and vinyl chloride in admixture with a fluidized bed catalyst.

3,579,598

DEHYDROCYCLIZATION PROCESS AND CATALYST

Rowland C. Hansford, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

No Drawing. Filed Aug. 14, 1967, Ser. No. 660,240
Int. Cl. C07c *5/18, 15/02;* B01j *11/16*
U.S. Cl. 260—673.5 7 Claims

Paraffin hydrocarbons are converted to aromatic hydrocarbons by dehydrocyclization at elevated temperatures and low pressures, in the presence of added hydrogen and a catalyst comprising minor proportions of a Group VIII noble metal and at least one oxide of the metals calcium, strontium, or barium, supported on a silica gel base.

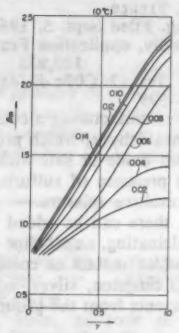
3,579,599

PROCESS FOR EXTRACT-SEPARATION OF AROMATIC HYDROCARBONS

Yoshiro Ito, Tamotsu Ueno, Takashi Nakano, and Kazuo Okamoto, Kurashiki-shi, Japan, assignors to Japan Gas-Chemical Company, Inc., Tokyo, Japan

Filed Nov. 18, 1968, Ser. No. 776,728
Claims priority, application Japan, Nov. 21, 1967, 42/74,896
Int. Cl. C07c *7/10*
U.S. Cl. 260—674 10 Claims

A process for extract-separating aromatic hydrocarbons having larger basicity into a hydrogen fluoride phase by allowing an extracting agent consisting of hydrogen fluoride and boron trifluoride to come in contact with a mixture containing two or more aromatic hydrocarbons having different basicity from each other. More particularly, a process for extract-separating aromatic hydrocarbons in a



high yield and purity without substantially refluxing said aromatic hydrocarbon having larger basicity, heretofore considered a necessity, by feeding extracting agent consisting of HF and BF_3, and diluent in highly precise amounts according to a predetermined correlation.

3,579,600

CATALYST FOR THE INTERCONVERSION OF PROPYNE AND PROPADIENE

Richard T. Dickerson, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Nov. 8, 1968, Ser. No. 774,487
Int. Cl. C07c *11/14, 11/22*
U.S. Cl. 260—678 10 Claims

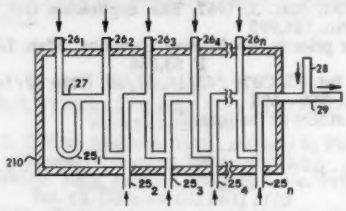
Propyne and propadiene are catalytically interconverted by a mixture of a highly polar solvent, e.g. dimethyl sulfoxide, and a base, e.g. potassium hydroxide. This process facilitates the conversion of C_3H_4 mixtures entirely to either propyne or propadiene as may be required for specific chemical application.

3,579,601

PYROLYSIS OF HYDROCARBONS

John A. Kivlen, Sparta, N.J., assignor to Esso Research and Engineering Company

Filed June 10, 1968, Ser. No. 738,716
Int. Cl. C07c *3/08;* C10g *9/20, 9/14*
U.S. Cl. 260—683 12 Claims



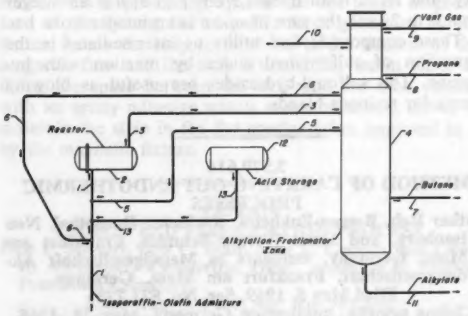
This invention relates to process and apparatus for the pyrolysis, or thermal cracking, of hydrocarbons or hydro-

carbon feedstocks to produce products useful as chemical raw materials or fuels. In particular, mobile hydrocarbons, i.e., normally gaseous or liquid paraffinic hydrocarbons, or other suitable feedstocks, are cracked to obtain unsaturated hydrocarbon compounds, particularly olefins. Faster reaction rates, increased product yields, and better selectivities are obtained by thermally cracking (with or without steam) a raw, or fresh hydrocarbon feed in admixture with a stream of hot reacting, thermally cracked (with or without steam) product. The process is thus characterized by steps wherein a feed is thermally cracked to form at least partially converted products, and fresh feed, which preferably is preheated to supply some of the needed sensible and reaction heat, is thermally cracked in admixture with the said at least partially converted products. In one embodiment, fresh hydrocarbon feed, and steam if desired, is preheated and fed at spaced locations through a tubular reactor, or reaction zone, resulting in fresh feed being contacted with at least partially converted products from a preceding portion of the tubular reactor, or reaction zone (except for the portion introduced at the entrance to the reactor).

3,579,602
OLEFIN CONVERSION PROCESS AND CATALYSTS THEREFOR
Robert E. Reusser, Bartlesville, Okla., assignor to Phillips Petroleum Company
No Drawing. Filed Apr. 3, 1967, Ser. No. 627,638
Int. Cl. C07c *5/00*
U.S. Cl. 260—683 **10 Claims**

Olefins are converted into other olefins of different molecular weight by contact with an olefin reaction catalyst, having activity for disproportionating propylene into ethylene and butene, which catalyst has been treated with an inorganic base or a material convertible to an inorganic base, followed by treatment with a stream of hydrogen, carbon monoxide, a gaseous acyclic olefin or a gaseous paraffin.

3,579,603
PROCESS UTILIZING LIQUID ACID SETTLING IN AN ALKYLATION-FRACTIONATOR
Edwin K. Jones, Kenilworth, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed June 4, 1969, Ser. No. 830,344
Int. Cl. C07c *3/54*
U.S. Cl. 260—683.48 **10 Claims**



An isoparaffin-olefin admixture is alkylated with a liquid acid alkylation catalyst (HF or H_2SO_4) and the total reaction effluent from the alkylator is passed to an alkylation-fractionator vessel which provides a settling zone therein for separating the liquid catalyst. The hydrocarbon phase undergoes fractionation and separate fractions are removed from above and below the settling zone. The process produces high octane alkylated hydrocarbons utilizing a simplified flow scheme where a single vessel separates the total reaction effluent.

3,579,604
ISOMERIZATION OF OCTALINS
Anthony L. Tumolo, Havertown, Pa., assignor to Sun Oil Company, Philadelphia, Pa.
No Drawing. Filed Apr. 27, 1970, Ser. No. 32,363
Int. Cl. C07c *13/08*
U.S. Cl. 260—666 **4 Claims**

An octalin is isomerized to another octalin, in particular 1,9-octalin to 9,10-octalin, by contact, preferably in a nonaqueous system, with strongly acidic ion exchange resin having a macroporous structure.

3,579,605
ISOMERIZATION OF OCTALINS
Anthony L. Tumolo, Havertown, Pa., assignor to Sun Oil Company, Philadelphia, Pa.
No Drawing. Filed Apr. 27, 1970, Ser. No. 32,436
Int. Cl. C07c *13/28*
U.S. Cl. 260—666 **6 Claims**

An octalin is isomerized to another octalin, in particular, 1,9-octalin to 9,10-octalin, by contact with a catalyst combination comprising silica gel and a hydrogen halide, or sulfuric acid, or phosphoric acid.

3,579,606
N-DECATRIENE ISOMERIZATION
Wilfried Umbach, Langenfeld, Germany, assignor to Henkel & Cie, GmbH, Dusseldorf-Holthausen, Germany
No Drawing. Filed Apr. 10, 1969, Ser. No. 815,185
Claims priority, application Germany, June 29, 1968, P 17 68 792.2
Int. Cl. C07c *11/00*
U.S. Cl. 260—677 **3 Claims**

As a new compound, n-decatriene-1,6,8, useful as a modifier for coating agents, particularly for reducing the dust drying time of air-drying alkyd resin coating agents.

3,579,607
POLYESTER-SUBSTITUTED ORGANOSILICON COMPOSITIONS
Markus Matzner, Edison, and Allen Noshay, East Brunswick, N.J., assignors to Union Carbide Corporation, New York, N.Y.
No Drawing. Filed Jan. 17, 1969, Ser. No. 792,132
Int. Cl. C08g *39/10, 47/10, 17/13*
U.S. Cl. 260—824 **13 Claims**

This invention relates to cyclobutane diol polyester-substituted organosilicon compositions characterized by a polymeric segment or block that is composed of recurring cyclobutylene groups linked to each other through carbonate linkages (—OCOO—) or di(carbonyloxy)hydrocarbylene linkages and that is chemically bonded to a silicon atom. The novel compositions have a silicon-containing segment derived from a silane or a siloxane. In the latter case, the compositions are block copolymers. The compositions are stable to heat and light and are useful as protective coatings, molding resins and elastomers.

3,579,608

WIRE COATING OF BROMINATED DIGLYCIDYL ETHER OF BISPHENOL A AND POLYVINYL CHLORIDE

John B. De Coste, Basking Ridge, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 26, 1968, Ser. No. 755,124
Int. Cl. C08g 45/04
U.S. Cl. 260—837 4 Claims

An abrasion resistant, insulating wire coating comprises plasticized vinyl chloride and a brominated bisphenol epoxy resin.

3,579,609

FLEX-RESISTANT POLYESTER FILM CONTAINING OLEFIN OR POLYTETRAMETHYLENE OXIDE ADDITIVE POLYMER

Robert J. Sevenich, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Filed Sept. 23, 1968, Ser. No. 761,786
Int. Cl. C08g 39/10, 51/54
U.S. Cl. 260—873 6 Claims

Physically blending minor amounts of fusible heat-stable polymers of lower-mono-alpha olefin or tetramethylene oxide into polyester resin which is to be extruded into a film and thereafter oriented, imparts unexpectedly superior flex resistance to the ultimate film. The film also displays excellent "slip" and, in many instances, improved electrical properties. Among the suitable additive polymers are polyethylene, polypropylene, polybutylene, poly-4-methyl pentene, ethylene vinyl acetate copolymer, ethylene propylene copolymers and polytetramethylene oxide.

3,579,610

PROTECTIVE AND DECORATIVE THERMO-SETTING COATING

John Christos Petropoulos, Norwalk, and Ralph Earl Layman, Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Oct. 2, 1968, Ser. No. 764,595
Int. Cl. C08g 37/32; C08f 37/18, 29/22
U.S. Cl. 260—853 10 Claims

A coating composition comprising an acrylic resin, polyvinylidene fluoride and hexakismethoxymethyl melamine is disclosed.

3,579,611

CROSSLINKED POLYOXYETHYLENES AND PROCESS THEREFOR

Fred F. Holub and Moyer M. Safford, Schenectady, N.Y., assignors to General Electric Company

No Drawing. Filed Dec. 26, 1967, Ser. No. 693,166
Int. Cl. C08f 29/50, 27/00
U.S. Cl. 260—874 10 Claims

Polyoxyethylenes are mixed with an organic crosslinking agent and an organic peroxide and heated at elevated temperatures to crosslink the polyoxyethylene to yield a water-insoluble polymer. These crosslinked polyoxyethylene compositions are useful as membrane material, wire coating, and the like and as water-insoluble coatings for cloth, metal, metallic screen, etc.

3,579,612

SUSPENSION SYSTEM FOR PRODUCING HIGH IMPACT POLYSTYRENE

Arthur I. Lowell, Edison, N.J., assignor to Mobil Oil Corporation

No Drawing. Filed Sept. 3, 1968, Ser. No. 757,152
Int. Cl. C08f 1/11, 15/04
U.S. Cl. 260—880 2 Claims

In the preparation of high impact polystyrene by bulk prepolymerization of a rubber in a styrene followed by aqueous suspension polymerization using water-soluble suspending agents, excessive foaming and emulsification occurs. These difficulties are reduced by using in the suspension system a combination of a water-soluble hydroperoxide and a water-soluble metal formaldehyde sulfoxylate or its equivalent, together with the water-soluble suspension agent.

3,579,613

POLYSALTS CONTAINING SULFONATED ACRYLICS

Raymond J. Schaper, Pittsburgh, and Merwin Frederick Hoover, Bethel Park, Pa., assignors to Calgon Corporation

No Drawing. Filed Nov. 16, 1967, Ser. No. 683,467
Int. Cl. C08f 29/50, 33/08
U.S. Cl. 260—901 3 Claims

Poly(sulfonated acrylics) are reacted with various cationic polymers to form polysalts.

3,579,614

2-CYANOVINYL PHOSPHATES AND PHOSPHOROTHIOATES

Bernard Miller, Plainsboro, and Howard Margulies, Princeton Junction, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Aug. 8, 1967, Ser. No. 659,014
Int. Cl. C07f 9/08; A01n 9/36
U.S. Cl. 260—940 9 Claims

The present invention relates to novel 2-cyanovinyl phosphates and phosphorothioates and their isomers, a method for their preparation and the use of said compounds for control of pests which damage or destroy agronomic crops and/or spread infection or disease to man, animal and bird populations.

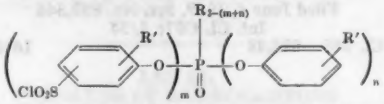
3,579,615

PHOSPHORUS-CONTAINING SULFONYL-CHLORIDES

John E. Herweh and Algirdas C. Poshkus, Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

No Drawing. Original application Apr. 6, 1966, Ser. No. 540,486, now Patent No. 3,423,485, dated Jan. 21, 1969. Divided and this application June 24, 1968, Ser. No. 765,716
Int. Cl. C07f 9/12, 9/40
U.S. Cl. 260—947 3 Claims

A class of chlorosulfonated phosphorus esters of the formula:



where R may be lower alkyl; R' may be Cl, NO_2, lower alkyl and H; m is an integer from 1 to 3; n is an integer from 0 to 2; and the sum of $m+n$ is an integer from 1 to 3. These compounds find utility as intermediates in the formation of sulfonylhydrazides by reaction with hydrazine. The sulfonyl-hydrazides are useful as blowing agents for resinous blends.

3,579,616

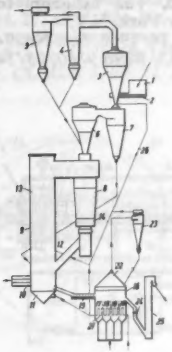
METHOD OF CARRYING OUT ENDOTHERMIC PROCESSES

Lothar Reh, Bergen-Enkheim, Karlheinz Rosenthal, Neu Isenburg, and Hans Werner Schmidt, Frankfurt am Main, Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 5, 1969, Ser. No. 821,773
Claims priority, application Germany, May 30, 1968, P 17 67 628.7
Int. Cl. F26b 3/08; F27b 15/00
U.S. Cl. 263—52 8 Claims

In an endothermic process, raw solids are first dried in a suspension-type heat-exchanger system by hot gas

coming from a fluidized-bed furnace with material recycling and then introduced into the fluidized bed. Hot solids taken from the fluidized bed are used in a heat



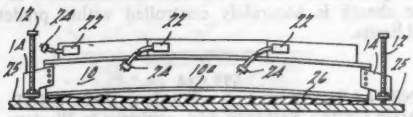
exchanger to preheat fresh air which is used as the fluidizing gas for the fluidized bed. Another portion of air is also heated in the heat exchanger and introduced in the fluidized bed as secondary air.

3,579,617

METHOD OF INSTALLING SURFACE PLATE

Robert H. Smith, Birmingham, Robert K. Payne, Troy, and Thomas Haw III, Detroit, Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Dec. 2, 1968, Ser. No. 780,529
Int. Cl. B32b *31/06;* E04b *1/16*
U.S. Cl. 264—34 **6 Claims**



A method of providing a perfectly flat surface plate for use as a measurement reference plane in styling automobiles, wherein a magnetic fixture having a flat lower magnetic face is positioned over the floor on which it is desired to provide the surface plate and a strip of cold rolled steel is positioned against the flat lower magnetic face of the fixture; the magnetic force generated by the fixture forces the strip to conform to the flatness of the magnetic face and the strip is thereafter set in place by filling the space between the strip and the base surface with an epoxy adhesive which, when hardened, serves to maintain the strip in the flat configuration imparted to it by the magnetic fixture.

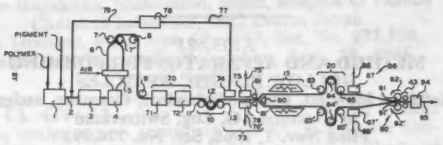
3,579,618

HIGH SPEED FIBRILLATION PROCESS

Dan F. Stewart, Bob C. Blair, Max E. Greene, and Lloyd R. Alexander, Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed Aug. 9, 1968, Ser. No. 751,458
Int. Cl. B29c *17/14;* B29d *7/24;* D01d *5/00*
U.S. Cl. 264—37 **4 Claims**

A process for forming a fibrillated product comprising forming a film from a flattened plastic tube, molecularly orienting the film and fibrillating the oriented film, wherein vacuum means remove from the system any loose ends of ribbons that may become severed during orientation,



preventing such severed ribbons from becoming entangled in the stretching rolls.

3,579,619

ROASTING MARL TO PRODUCE A POZZOLANA MATERIAL

Dietrich Harkort, Am Schwalbenschwanz 56; and Rudolf Rasch, Georg-Speyer-Strasse 86, both of 6 Frankfurt am Main, Germany; Rolf Iberg, Chapfstrasse 19, CH–8142 Uitikon, Switzerland; and Jurg H. Heberlein, Rohrbaldenstrasse 41, CH–8712 Stafa, Switzerland

No Drawing. Filed Aug. 23, 1968, Ser. No. 754,993
Claims priority, application Germany, Aug. 25, 1967, B 94,148
Int. Cl. C04b *7/12, 7/44*
U.S. Cl. 264—42 **2 Claims**

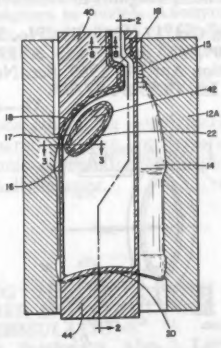
Construction materials of high strength and low volumetric weight are formed by hardening in an autoclave at about 165° and at an atmospheric pressure and for a time such that the multiplicand equals about 65 atmosphere hours a thermally active earth mixed with water. The earth or "washed clay" is a mineral substance or marl comprising by weight calcium carbonate (10–30%), clay minerals (40–70%) and quartz (20–50%) having about a 1:1 ratio of $CaO:SiO_2$ and a TiO_2 content of 0.2 to 3%. The marl is first roasted at a temperature below its melting phase (700–900° C.) and crushed to a grain size of 4 to 6 mm. 4–8% by weight of portland cement, lime or hydraulic lime is added before hardening to give increased compression strength to the final construction material.

3,579,620

BLOW MOLDING

Lennart K. Pettersson, Bloomfield, Conn., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 26, 1968, Ser. No. 778,995
Int. Cl. B29c *17/07*
U.S. Cl. 264—98 **15 Claims**



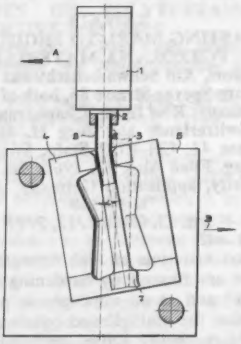
Parison pinch off surfaces of a blow mold and/or the area of the mold defining an opening extending through the body of a handleware container are kept at elevated temperature in comparison with remaining cooled portions of the mold during closing of the mold sections and

formation of the article, in order to facilitate subsequent removal of waste flash which is integrally formed with the article in these areas of the mold.

3,579,621
METHOD AND APPARATUS FOR FORMING HOLLOW PLASTIC ARTICLES

Gottfried Mehnert, Berlin-Mariendorf, Germany, assignor to Conduco AG, Zug, Switzerland

Filed Nov. 7, 1968, Ser. No. 774,091
Claims priority, application Germany, Nov. 10, 1967, P 17 04 209.0
Int. Cl. B29c *17/06, 17/07, 23/00*
U.S. Cl. 264—99 13 Claims

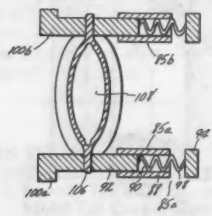


The extruder of a blow molding apparatus extrudes a tubular blank and moves continuously with reference to a series of sectional blow molds or vice versa. The movements of mold sections to closed positions are timed in such a way that the upper end of the extruded portion of the blank is clampingly engaged by the mold sections later than the lower end or vice versa, always with such a delay that the axis of the thus engaged portion of the blank is coaxial with the mold cavity. This is achieved by pivoting the mold sections between upright and inclined positions or by providing the mold sections with movable upper or lower blank-engaging parts.

3,579,622
METHOD FOR BLOW MOLDING PLASTIC ARTICLES

Charles H. Shaw, Bloomfield, and Robert G. Strauss, West Hartford, Conn., assignors to Monsanto Company, St. Louis, Mo.

Original application Oct. 17, 1966, Ser. No. 587,255, now Patent No. 3,509,596, dated May 5, 1970. Divided and this application Apr. 10, 1969, Ser. No. 839,746
Int. Cl. B29c *17/07*
U.S. Cl. 264—99 1 Claim

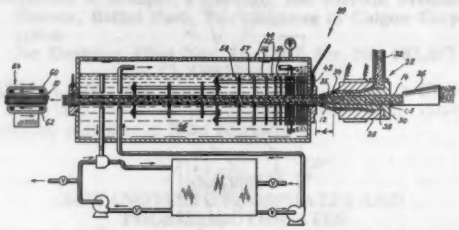


A method of blow molding a hollow article wherein the parison is preblown and then allowed to partially deflate and shrink in size to obtain the benefit of stretching during pre-inflation while avoiding chill marks in the finished article.

3,579,623
FORMING FILLED CONTINUOUS PLASTIC ROD SUCH AS PLASTIC CIGARETTE FILTER ROD FILLED WITH A TOW OF CELLULOSE ACETATE

Richard N. Thomson, Jerome S. Osmalov, and George L. Mathe, Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed July 24, 1968, Ser. No. 747,279
Int. Cl. B29d *9/00, 23/14*
U.S. Cl. 264—135 3 Claims

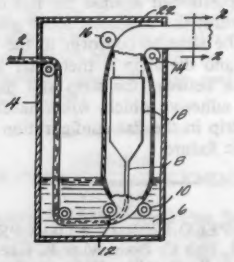


A method with which a continuous length, tubular article filled with a gas or liquid pervious filler material such as a tow filled plastic cigarette filter rod is formed by extruding plastic as a sheath around an advancing bloomed tow of fibrous filter material, heat from the plastic extrudate being utilized in the course of the forming operations to accelerate curing of a plasticizer impregnating the tow. A crosshead type extrusion die is utilized for the forming operation and is provided with a central tube extending longitudinally therein for receiving the advancing tow and isolating it from the molten plastic with which the extrudate is formed, the latter entering the die laterally and issuing from the mouth thereof as a continuous tubular sheath which makes first contact with the tow at a distance downstream of the die mouth. The extrudate on leaving the crosshead die is then sized by passing it through a cooling chamber wherein the external dimension of the plastic sheath is accurately controlled within predetermined limits.

3,579,624
INSULATED ALKALI METAL CONDUCTOR

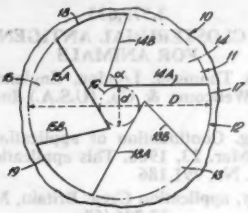
Alvin Guttag, Bethesda, Md., assignor to Weston Chemical Corporation, New York, N.Y.

Original application Sept. 25, 1967, Ser. No. 670,166. Divided and this application Mar. 7, 1969, Ser. No. 828,037
Int. Cl. B29c *27/20;* B29f *3/10;* D01d *5/16*
U.S. Cl. 264—171 19 Claims



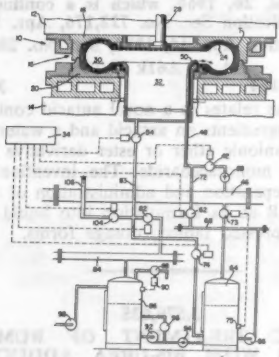
Electrical conductors comprising an alkali metal conducting core are coated with a preformed heat shrinkable inert olefin hydrocarbon polymer film or sheet and the hydrocarbon shrunk into tight engagement with the alkali metal. The heat of the molten metal or of the metal while it is cooling can be used to shrink the polymer.

3,579,625
PROCESS FOR FORMING TRILOBAL YARNS
Jean-Louis Jacquinet, Lyon, Rhone, France, assignor to Société Rhodiaceta
Filed Sept. 27, 1967, Ser. No. 670,862
Claims priority, application France, Sept. 29, 1966, 78,186; Aug. 11, 1967, 117,816
Int. Cl. B29f *3/00, 21/54*
U.S. Cl. 264—177 4 Claims



The invention discloses a spinneret for producing a trilobal filament, and filaments produced using such spinneret. The shape of each orifice of the spinneret can be considered as being produced by a circular aperture, diameter D into which project at 120° intervals, three identical triangular portions, sides of the triangles being tangent to one or more coaxial circles having a diameter between ⅛ and ⅓ of D, the angle at the apex of each triangle being between 60 and 100°.

3,579,626
METHOD FOR CURING TIRES AND THE LIKE
Glenn B. Brittain, Amiens, France, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Oct. 30, 1968, Ser. No. 771,757
Int. Cl. B29h *5/01, 5/02*
U.S. Cl. 264—297 19 Claims



A method for curing tires in a bladder-equipped press. During the main heating period, the bladder is filled first with steam to conform the tire and bladder to the mold and to begin the cure of the tire. The steam is then replaced with water at a high pressure and at a temperature approximately equal to the maximum permissible vulcanizing temperature so as to maintain the tire against the mold and to continue the cure. In the final phase of the main heating period, steam at a high pressure at least equal to the vapor pressure of the water is utilized to force the water, without vaporization, from the bladder without interruption of the curing operation. The remaining steam is then vented to the atmosphere. In this manner, the water used to cure the tire can be reused without a change of state and the bladder is maintained at a high temperature for subsequent curing cycles.

3,579,627
Rh_0 BLOOD TESTING SERUM
Zenro Hayakawa, Matsumoto, Japan, assignor to Takeda Chemical Industries, Ltd., Osaka, Japan
No Drawing. Filed Sept. 29, 1967, Ser. No. 671,550
Claims priority, application Japan, Sept. 29, 1966, 41/64,581
Int. Cl. G01n *33/16*
U.S. Cl. 424—11 2 Claims

Rh_0 testing serum comprises anti-Rh_0 incomplete antibody of human origin and anti-Rh_0 complete antibody of animal origin, the Coombs titre and the agglutinin titres being at least about 32 and about 16, respectively, the ratio of Coombs titre to agglutinin titre being from about 1:2 to about 8:1.

3,579,628
DRESSING FILM
Robert J. Gander, Whitehouse, and David T. Rovee, Hopewell, N.J., assignors to Johnson & Johnson
No Drawing. Filed July 3, 1967, Ser. No. 650,599
Int. Cl. A61l *15/00, 15/01, 15/03*
U.S. Cl. 424—28 11 Claims

Dressings having a hydrophilic acrylic film component adapted to contact a wound surface are prepared in which the wound contacting film is insoluble in body fluids but has a substantial affinity for water. Moisture absorbed by the film acts to plasticize the film and provide a moist, flexible, conforming surface to the underlying wound tissue. The dressing may consist of a single piece of the hydrophilic acrylic film or the film may form a part of a composite dressing wherein the wound contacting surface of the dressing is formed of a hydrophilic acrylic film. The hydrophilic acrylic films are particularly suitable for use as occlusive dressings and for controlling the proliferation of bacteria where the same have, dispersed therethrough, compositions which react with water to generate a bacteriostatic substance. Where the film base is a hydrophilic acrylic the effectiveness of the presence of the bacteriostat-generating materials, when present, is appreciably increased while any chance of tissue irritation is substantially reduced.

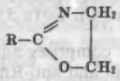
3,579,629
SALTS OF COPOLYMERS OF VINYL ACETATE/CROTONIC ACID/VINYLIC OR ALLYLIC OR METHALLYIC ESTERS IN HAIR COSMETICS
Regine Pasero, nee Perruche, and Andre Viout, Paris, France, assignors to Societe Anonyme dite: L'Oreal
No Drawing. Filed July 25, 1967, Ser. No. 655,770
Claims priority, application France, Aug. 3, 1966, 71,998
Int. Cl. A61k *7/06*
U.S. Cl. 424—47 7 Claims

Compositions containing copolymers for use as hair dressing preparations. The copolymers consist of vinyl acetate, crotonic acid and either a vinylic ester, allylic ester or methallylic ester.

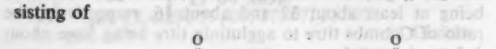
3,579,630
TREATING THE HAIR WITH OXAZOLINE POLYMER AND COPOLYMER HAIR DRESSING FORMULATIONS
Jack L. Herz, Parsippany, Alan J. Levy and Morton H. Litt, Morristown, and Joseph L. Zuckerman, Livingston, N.J., assignors to Allied Chemical Corporation, New York, N.Y.
No Drawing. Filed Dec. 29, 1966, Ser. No. 605,590
Int. Cl. A61k *7/06*
U.S. Cl. 424—47 9 Claims

An improved hair dressing formulation containing (a) from about 0.1 to about 10 weight percent of a water-

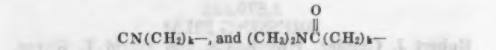
dispersible polymer having a reduced viscosity ranging from about 0.5 to about 5.0 as determined on a 0.52 weight percent solution of polymer in meta-cresol at 25° C., said polymer being selected from the group consisting of homopolymers and copolymers of monomers of the formula:



wherein R is a substituent selected from the group consisting of



wherein the sum of the integers m and n is not greater than 6, and



wherein k is 0 to 3; and (b) a carrier for said polymer selected from the group consisting of water, ethanol, isopropanol, and mixtures thereof.

3,579,631

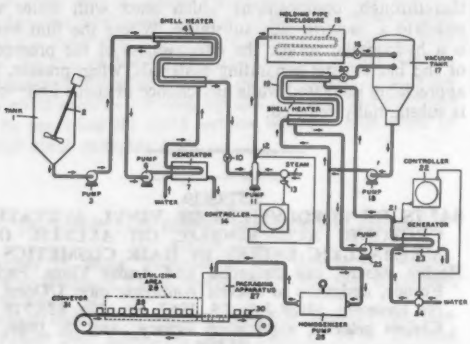
STERILIZATION OF MATERIALS CONTAINING PROTEIN

Aubrey P. Stewart, Jr., 801 Grove Ave.; Clarence R. Dreier, Jr., 1101 Nodaway St.; and Jim C. Gregory, 17th and Grove St., all of Corning, Iowa 50841

Filed May 21, 1968, Ser. No. 730,854

Int. Cl. A61k *23/02*

U.S. Cl. 424—86 **5 Claims**



A process for sterilizing heat-sensitive materials in which the protein coagulates at high temperature, said process including dilution of the material followed by high temperature short time sterilization thereof, without said protein coagulating.

3,579,632

HAIR AND SCALP TREATMENT WITH A PRINCIPALLY SODIUM CHLORIDE THICK VISCOUS AQUEOUS SLURRY

Victor G. Sonnen, Broad Brook Road, Hazardville, Conn. 06036

No Drawing. Filed Aug. 2, 1965, Ser. No. 476,640

Int. Cl. A61k *7/06*

U.S. Cl. 424—70 **14 Claims**

A hair conditioner composition, useful in reducing the drying time of the hair after washing and causing the hair to become more manageable, and also having dandruff alleviating properties, is provided comprising 30–76 parts by weight of a salt of at least 60% NaCl having a particle size preferably in the range of 0.00025 to 0.00125 inch and 70–24 parts by weight of water. The composition may also include thickening agents, a fatty alcohol, detergent, lanolinic material, perfume and dye.

3,579,633

MULTIPLE CLOSTERIDIAL ANTIGEN VACCINE FOR ANIMALS

Robert Orrock Thomson, London, England, assignor to Burroughs Wellcome & Co. (U.S.A.) Inc., Tuckahoe, N.Y.

No Drawing. Continuation of application Ser. No. 536,606, Mar. 23, 1966. This application Jan. 14, 1969, Ser. No. 791,186

Claims priority, application Great Britain, Mar. 25, 1965, 12,726/65

Int. Cl. A61k *23/00*; C12k *5/00*

U.S. Cl. 424—92 **12 Claims**

An injectable vaccine preparation comprising aqueous antigenic material derived from at least two pathogenic costridium species, a mineral oil, lipophilic emulsifier and a hydrophilic emulsifier, the preparation being a stable, parenterally acceptable emulsion of an aqueous antigenic phase dispersed in a continuous oil phase, wherein the aqueous phase comprises from 10 to 35% of the volume of the preparation.

3,579,634

NOVEL ANTACID COMPOSITIONS AND METHODS FOR THEIR ADMINISTRATION

Garland Richard Brown, 5522 W. Hamilton Road, Fort Wayne, Ind. 46809

No Drawing. Continuation-in-part of application Ser. No. 785,727, Dec. 20, 1968, which is a continuation-in-part of application Ser. No. 722,176, Apr. 18, 1968. This application Apr. 14, 1970, Ser. No. 28,297

Int. Cl. A61k *27/00*

U.S. Cl. 424—154 **33 Claims**

The invention relates to a novel antacid containing as the essential ingredients an antacid and a water dispersible, colloidal anionic ether or ester derivative of a low polymer of a monosaccharide. The invention includes methods of preparation and administration of the novel antacid, as well as its formulation into liquid or solid, including compressed tablets, dosage forms.

3,579,635

ANTIBIOTIC TREATMENT OF RUMINANT ANIMALS WITH BIS-UREA ADDUCTS OF ALDEHYDE-CONTAINING MACROLIDE ANTIBIOTICS

Arthur P. Raum, New Palestine, and Richard M. Kline, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Continuation-in-part of application Ser. No. 744,627, July 15, 1968, which is a continuation-in-part of application Ser. No. 687,499, Dec. 4, 1967. This application Oct. 8, 1969, Ser. No. 864,852

Int. Cl. A61k *21/00*

U.S. Cl. 424—181 **2 Claims**

Ruminants are treated for therapeutic or growth-promoting purposes with novel bis-urea adducts of aldehyde-containing macrolide antibiotics which derivatives are antibiotically inactive though substantially chemically stable in the rumen, but which are unstable in the abomasum wherein they are converted to a macrolide antibiotic.

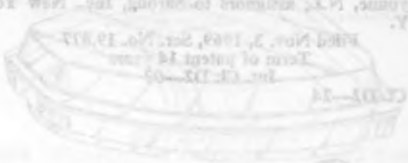
3,579,636

UREA SYNTHESIS PROCESS

Ivo Mavrovic, 530 E. 72nd St., New York, N.Y. 10021

Filed May 16, 1968, Ser. No. 729,764
Int. Cl. C07c 127/00
U.S. Cl. 260—555 11 Claims

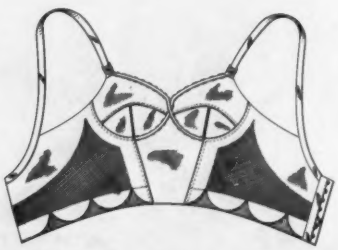
Urea recycle process in which water content of recycled NH_3 and CO_2 is reduced and conversion in urea reactor is increased. Major portion of the heat of reaction generated from the condensation of the recycled NH_3 and CO_2 gases to form an aqueous ammonium carbamate solution is recovered in heat exchange with reactor feed streams, to produce steam in a reactor coil. Heat generated in a urea synthesis reactor is used in one or more related operating units including ammonium carbamate decomposers, thus providing an efficient process heat balance.



DESIGNS

MAY 18, 1971

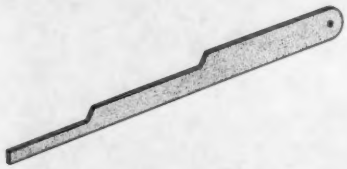
220,741
BRASSIERE
Joseph P. Marcario, Saddle Brook, and Jack J. LoCascio, Bayonne, N.J., assignors to Sarong, Inc., New York, N.Y.
Filed Nov. 3, 1969, Ser. No. 19,877
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—24



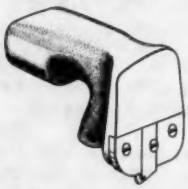
220,742
SWIM SUIT OR SIMILAR ARTICLE
Edward H. Mohl, 5716 Woodbine Ave., Philadelphia, Pa. 19131
Original design application Nov. 25, 1968, Ser. No. 14,642, now Patent No. 216,245, dated Dec. 9, 1969. Divided and this application July 24, 1969, Ser. No. 19,343
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—42

220,743
GOGGLES
Theodore C. Neward, 2066 W. 11th St., Upland, Calif. 91786
Original design application Apr. 7, 1969, Ser. No. 16,604, now Patent No. 218,547, dated Sept. 1, 1970. Divided and this application Jan. 16, 1970, Ser. No. 20,958
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—234

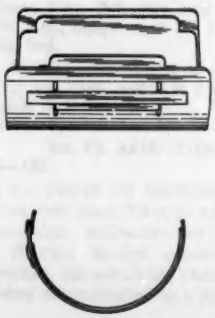
220,744
FRICTION TYPE BOTTLE CAP REMOVER
James E. Guthrie, 5917–B Woodson Road, Kansas City, Mo. 64133
Filed Sept. 2, 1969, Ser. No. 18,943
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—18



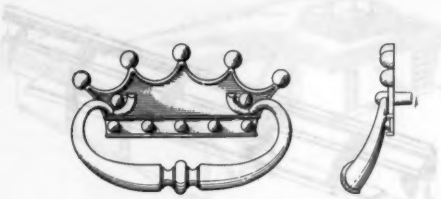
220,745
GLASS CUTTING TOOL
Stephen J. Kovacik, Rossford, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio
Filed Apr. 20, 1970, Ser. No. 22,514
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—51



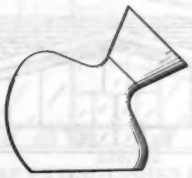
220,746
TYPE SOLDERING JIG
Robert C. Lokey, Tamal, Calif. (% Lokey Tool, Inc., 220 Juana Ave., San Leandro, Calif. 94577)
Filed Nov. 5, 1969, Ser. No. 19,961
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—71



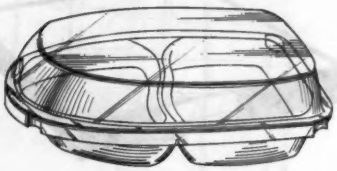
220,747
STATIONARY PULL
James R. Deadrick, Winston-Salem, N.C., assignor to Stewart-Warner Corporation, Chicago, Ill.
Filed Feb. 9, 1970, Ser. No. 21,340
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—159



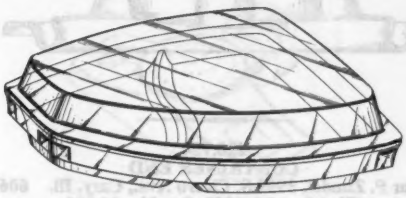
220,748
BOTTLE
Jerome Gould, Encino, Calif., assignor to Johnson & Johnson
Filed June 1, 1970, Ser. No. 23,240
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—82



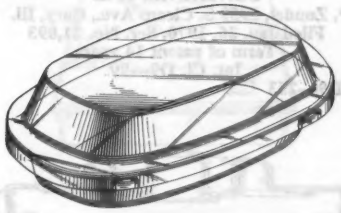
220,749
COMBINED PACKAGING TRAY AND COVER
Kenneth W. Artz, Mohnton, Pa., assignor to W. R. Grace & Co., Duncan, S.C.
Filed Dec. 17, 1968, Ser. No. 15,018
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D9—185



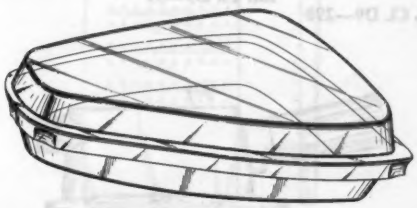
220,750
COMBINED PACKAGING TRAY AND COVER
Kenneth W. Artz, Mohnton, Pa., assignor to W. R. Grace & Co., Duncan, S.C.
Filed Dec. 17, 1968, Ser. No. 15,021
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D9—185



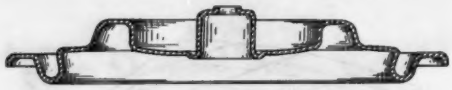
220,751
COMBINED PACKAGING TRAY AND COVER
Kenneth W. Artz, Mohnton, Pa., assignor to W. R. Grace & Co., Duncan, S.C.
Filed Dec. 17, 1968, Ser. No. 15,022
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D9—219



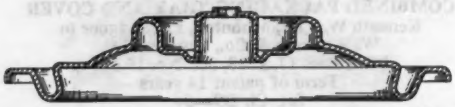
220,752
COMBINED PACKAGING TRAY AND COVER
Kenneth W. Artz, Mohnton, Pa., assignor to W. R. Grace & Co., Duncan, S.C.
Filed Dec. 17, 1968, Ser. No. 15,023
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D9—219



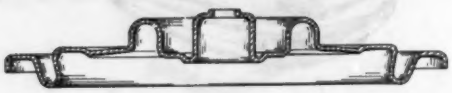
220,753
CONTAINER END
Arthur P. Zundel, 5959 S. Cicero Ave., Cary, Ill. 60638
Filed Jan. 26, 1970, Ser. No. 21,080
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—253



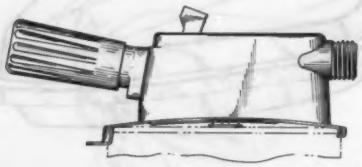
220,754
CONTAINER END
Arthur P. Zundel, 5959 S. Cicero Ave., Cary, Ill. 60638
Filed Jan. 26, 1970, Ser. No. 21,081
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—253



220,755
CONTAINER END
Arthur P. Zundel, 5959 S. Cicero Ave., Cary, Ill. 60638
Filed Jan. 26, 1970, Ser. No. 21,093
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—253

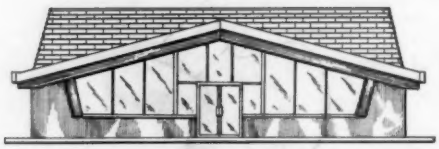


220,756
UNIT FOR DISPENSING LIQUID FROM A CONTAINER
Richard D. Zenger, 2745 College Ave., Downers Grove, Ill. 60515, and Raymond M. Traczyk, 5428 S. Sayre, Chicago, Ill. 60638
Continuation-in-part of design application Ser. No. 10,963, Mar. 13, 1968. This application Sept. 22, 1969, Ser. No. 19,490
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—290

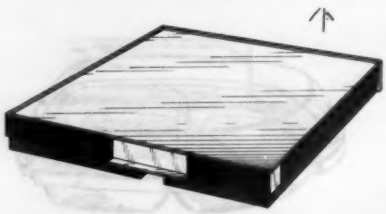


220,757
BOTTOM RAIL FOR A ROLL-TYPE DOOR
Richard E. Smith, Columbus, Ohio, assignor to Kinnear Corporation, Columbus, Ohio
Filed Sept. 11, 1969, Ser. No. 19,116
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—1

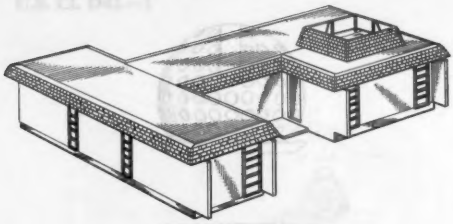
220,758
BUILDING
Donald J. Thomas, St. Louis County, Mo., assignor to Burger Chef Systems, Inc.
Filed Nov. 26, 1969, Ser. No. 20,295
Term of patent 14 years
Int. Cl. D25—*04*
U.S. Cl. D13—1



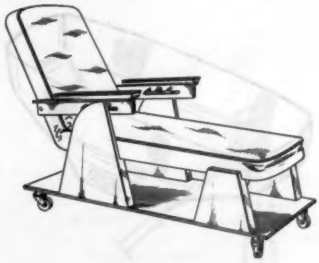
220,759
BUILDING OR THE LIKE
William C. Renwick, Barrington, Ill., assignor to Brunswick Corporation, Chicago, Ill.
Filed Apr. 8, 1970, Ser. No. 22,332
Term of patent 14 years
Int. Cl. D25—*04*
U.S. Cl. D13—1



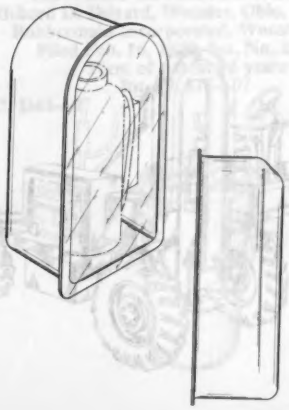
220,760
MODULAR HOME
John M. Evans, Fort Lauderdale, Fla., assignor to Behring Corporation, Fort Lauderdale, Fla.
Filed Apr. 10, 1970, Ser. No. 22,371
Term of patent 14 years
Int. Cl. D25—*04*
U.S. Cl. D13—1



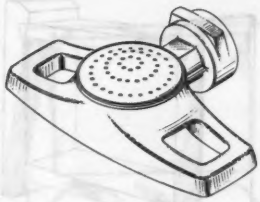
220,761
MOBILE LOUNGE CHAIR
Clarence E. Jackson, P.O. Box 1109, Texas City, Tex. 77590
Filed Dec. 19, 1969, Ser. No. 20,577
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D15—11



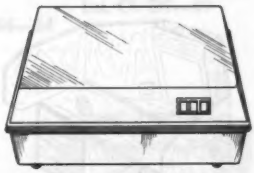
220,762
FIRE EXTINGUISHER HOUSING
Lawton M. Dial, Jr., and Louis J. Grossheim, Houston, Tex., Donald M. Schramme, Baton Rouge, La., and Walter H. Zennecker, Houston, Tex., assignors to Arthur Dooley and Son, Inc., Beaumont, Tex.
Filed Feb. 12, 1970, Ser. No. 21,411
Term of patent 14 years
Int. Cl. D29—*01*
U.S. Cl. D16—2



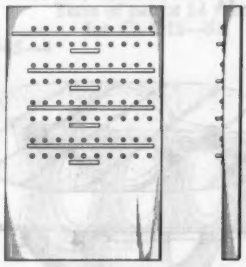
220,763
LAWN SPRINKLER
Melvin H. Best, Pasadena, Calif., assignor to Rain Bird Sprinkler Mfg. Corp., Glendora, Calif.
Filed Feb. 16, 1970, Ser. No. 21,450
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—7



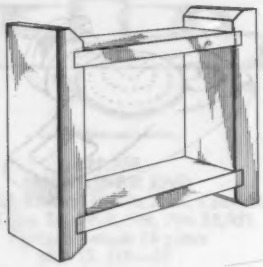
220,764
HOUSING FOR COMPUTER INTERFACE UNIT
Charles J. Ortega, Van Nuys, and Frederic L. Naff, Jr., Los Angeles, Calif., assignors to Computer Transmission Corporation, Los Angeles, Calif.
Filed Mar. 23, 1970, Ser. No. 22,016
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



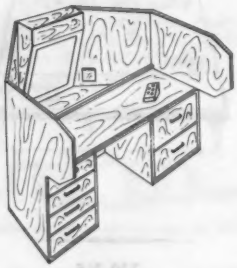
220,765
PANEL BOX FOR REFRIGERATOR CONTROL
Gus Romanias, 2611 S. Grant St., Arlington, Va. 22202, and Herman H. Gorham, 5616 Bouffant Blvd., Alexandria, Va. 22311
Filed Nov. 28, 1969, Ser. No. 20,302
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13



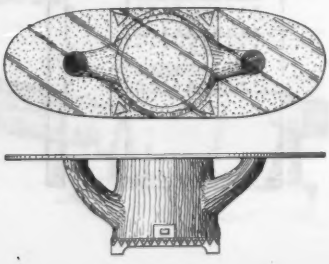
220,766
STANDARD FOR USE IN SUPPORTING HORIZONTAL BOOKSHELVES
Phillip E. Miller, 1861 Heatherdale Ave., San Jose, Calif. 95126
Filed July 16, 1969, Ser. No. 18,225
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D33—3



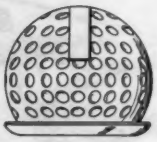
220,767
INSTRUCTION CUBICLE
Lawrence H. Power, 710 Leona Drive, Ann Arbor, Mich. 48103
Filed Jan. 6, 1970, Ser. No. 20,776
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D33—7



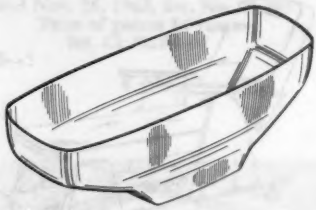
220,768
COCKTAIL TABLE
John H. Jordan, Jr., 8211 S. Maryland Ave., Chicago, Ill. 60619
Filed Aug. 29, 1969, Ser. No. 18,919
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D33—14



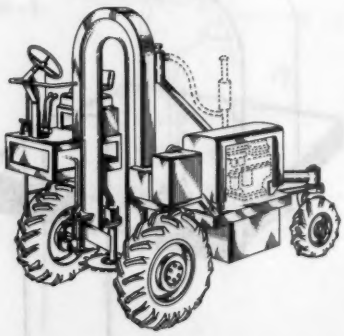
220,769
SLIDABLE GOLF BALL FOR PUTTING PRACTICE
Paul D. LaHue, 5880 N. Rural, Indianapolis, Ind. 46220
Filed Nov. 7, 1969, Ser. No. 19,986
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



220,770
PLANTER BOWL
Lynn R. Townsend, 10707 Jamacha Blvd., Space 174, Spring Valley, Calif. 92077
Filed Sept. 5, 1969, Ser. No. 19,041
Term of patent 14 years
Int. Cl. D31
U.S. Cl. D35—1



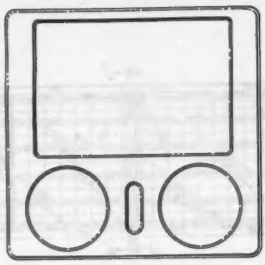
220,771
POWER TRAIN FOR SUGAR HARVESTERS
Vernon P. Broussard, P.O. Box 227, St. Martinville, La. 70582
Continuation-in-part of abandoned design application Ser. No. 11,429, Apr. 12, 1968. This application Dec. 18, 1969, Ser. No. 20,558
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1



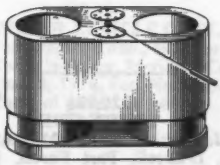
220,772
PULLER
Harold V. Hawkins, 4985 Meadowbrook Road; and Ralph A. Dick, 8667 Bonview, both of Williamsville, N.Y. 14221; and John Wendel, 42 Susan Lane, Cheektowaga, N.Y. 14225
Filed Feb. 5, 1970, Ser. No. 21,286
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D41—1

220,773
COVERED BEVERAGE PITCHER
Richard D. Dilyard, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Feb. 16, 1970, Ser. No. 21,558
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—1

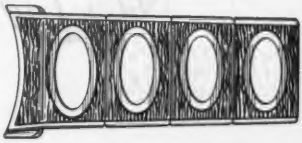
220,774
FOOD SERVICE TRAY
Harford E. Goings, 5428 Center Drive, Camp Springs, Md. 20031
Filed Oct. 10, 1969, Ser. No. 19,496
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—10



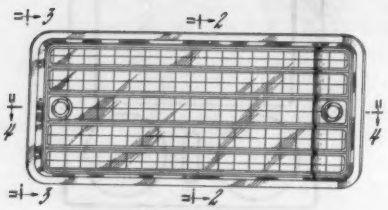
220,775
COMBINED EGG HOLDER AND OPENER, CONDIMENT DISPENSERS AND HOLDER THEREFOR AND SPOON HOLDER
Frank D. O'Neill, 94 Willcocks St. W., Toronto, Ontario, Canada
Filed Feb. 10, 1970, Ser. No. 21,392
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D44—24

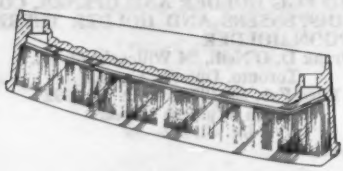


220,776
EXPANSIBLE END LINK FOR A BRACELET OR SIMILAR ARTICLE
Murray L. Cowan, Norwood, Mass., assignor to Textron Inc., Providence, R.I.
Filed May 5, 1970, Ser. No. 22,815
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—4

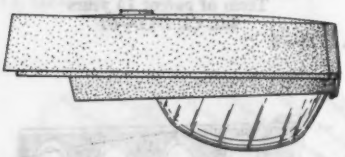


220,777
MOTOR VEHICLE LAMP LENS
Philip Garcia, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Jan. 26, 1970, Ser. No. 21,067
Term of patent 7 years
Int. Cl. D12—*99*
U.S. Cl. D48—32

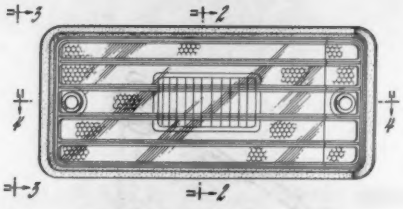


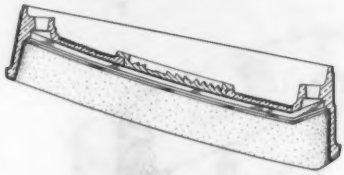


220,778
LUMINAIRE
Edward R. Jablonski, South Milwaukee, Wis., and Giacinto C. D'Ercoli, Part Forest, Ill., assignors to McGraw-Edison Company, South Milwaukee, Wis.
Filed Jan. 26, 1970, Ser. No. 21,083
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31

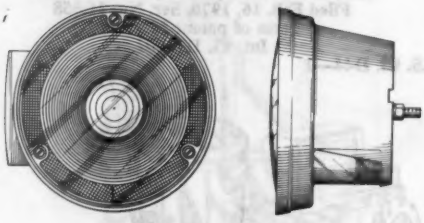


220,779
MOTOR VEHICLE LAMP LENS
Philip Garcia, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Jan. 26, 1970, Ser. No. 21,089
Term of patent 7 years
Int. Cl. D12—*99*
U.S. Cl. D48—32



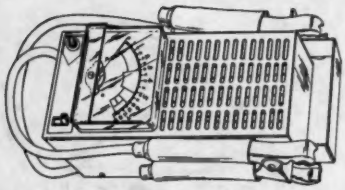


220,780
AUTOMOTIVE LAMP
Charles J. Newman, Madison, Ind., assignor to The Grote Manufacturing Company, Madison, Ind.
Filed Apr. 27, 1970, Ser. No. 22,685
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D48—32



220,781
BALLOON VENDING MACHINE
Monte L. Levin, New York, N.Y., assignor to Miner Industries, Inc., New York, N.Y.
Filed May 14, 1970, Ser. No. 22,984
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D52—3

220,782
PORTABLE BATTERY TESTER
Albert Mazeika, Chicago, Ill., assignor to Milton Manufacturing Company, Inc., Chicago, Ill.
Filed July 10, 1970, Ser. No. 23,894
Term of patent 14 years
Int. Cl. D10—*11*
U.S. Cl. D52—6

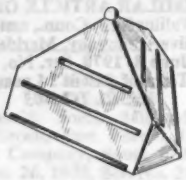


220,783
SPOON OR SIMILAR ARTICLE OF FLATWARE
Ronald A. Guodace, Tracy, Conn., assignor to International Silver Company, Meriden, Conn.
Filed June 8, 1970, Ser. No. 23,341
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

220,784
SPOON OR SIMILAR ARTICLE OF FLATWARE
Robert King, Wallingford, Conn., assignor to International Silver Company, Meriden, Conn.
Filed June 8, 1970, Ser. No. 23,382
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

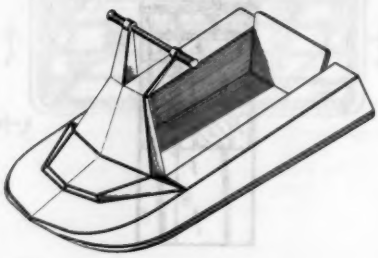
220,785
SPOON OR SIMILAR ARTICLE OF FLATWARE
Siro R. Toffolon, Meriden, Conn., assignor to International Silver Company, Meriden, Conn.
Filed June 10, 1970, Ser. No. 23,432
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

220,786
PHOTOGRAPHIC SLIDE SORTING RACK
Aaron E. Gandy, P.O. Box 741, 2613 W. Storey, Midland, Tex. 79701
Filed Apr. 22, 1970, Ser. No. 22,571
Term of patent 14 years
Int. Cl. D16—*99*
U.S. Cl. D61—1

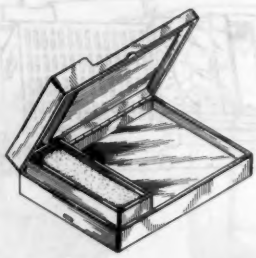


220,787
TYPEWRITER
John Svezia, Millburn, N.J., assignor to Ing. C. Olivetti & Co., S.p.A., Ivrea, Italy
Filed Feb. 24, 1970, Ser. No. 21,576
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11

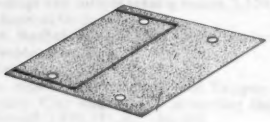
220,788
OCCUPANT-BODY-STEERABLE SELF-PROPELLABLE AQUAPLANE OR SIMILAR ARTICLE
Joe E. Piazza, Pacifica, Calif., assignor to Leisure Products Corporation, Menlo Park, Calif.
Filed Apr. 15, 1970, Ser. No. 22,450
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D71—1

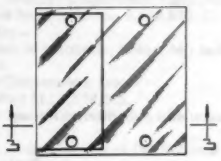


220,789
COSMETIC CASE
Klein K. Haddaway, 1650 21st Road N., Arlington, Va. 22209
Filed Aug. 8, 1969, Ser. No. 18,594
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10

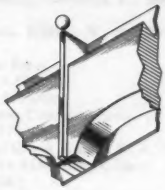


220,790
IDENTIFICATION TAG BLANK
William T. Rives, 38 Decorie Drive, Wilbraham, Mass. 01095
Filed June 16, 1969, Ser. No. 17,730
Term of patent 14 years
Int. Cl. D20—*99*
U.S. Cl. D96—3





220,791
SIGN PANEL
Marilyn Lewis, Beverly Hills, Calif., assignor to Hamburger Hamlets, Inc.
Filed Dec. 15, 1969, Ser. No. 20,494
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12



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PATENTS WERE ISSUED ON THE 18TH DAY OF MAY, 1971

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Kleinhagauer, Otmar; Samejima, Hirotoshi; Holzgruber, Wolfgang; Cerwenka, Peter; Nakayama, Kiyoshi; Nagano, Yuji; and Hladny, Wolfgang, to Gebr., Bohler & Co. Aktiengesellschaft Kyowa Hakko Kogyo Kabushiki Kaisha. Foodstuffs containing an anti- Electrical component clamping device in an electro-melting installation for metals oxidant. 3,579,357, Cl. 13-16.
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Knirsch, Herbert, to Schlumberger Overseas Messgeratebau und Vertrieb GmbH. Frequency mixer. 3,579,116, Cl. 325-439.
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Kuhnis, Hans Herbert; and Renner, Ulrich, to Geigy Chemical Corporation. 1-(1-substituted-4-acetonyl-4-piperidyl)-1- butanones. 3,579,513, Cl. 260-240.

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Massa, Frank, to Massa Division, Dynamics Corporation of America. Transducers of the bilaminar flexural vibrating type. 3,578,995, Cl. 310-8.8

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Young, Robert P. T., to SCM Corporation, mesne. Process for reconstituting natural citronella. 3,579,468, Cl. 252-522.

Zahn, Paul; and Merges, Veit, to Knapsack Aktiengesellschaft Bolkow Gesellschaft mit beschrankter Haftung. Column for carrying out organic chemical reactions in contact with fine, particulate catalysts Modular thermogenerator. 3,579,388, Cl. 136-202.

Zaslowsky, Joel A.; and Gould, Henry, to Alcolac Chemical Corporation. Sulfonate monomers. 3,579,565, Cl. 260-485.

Zeller, Paul: *See—*
Muller, Marcel; and Zeller, Paul,3,579,502.

Zellweger, Ltd.: *See—*
Piechocki, Kurt Wilhelm, 3,579,236.

Ziegler, Karl; and Breil, Heinz, said Breil assor to said Ziegler. Polymerization of ethylene using reduced group IVB, VB and VIB metal salts as the polymerization catalyst. 3,579,493, Cl. 260-94.9

Zoja, Giorgio, to Laboratorio Chimico Farmaceutico Giorgio Zoja S.p.A.Process for the preparation of the dextrorotatory 2,2'-(ethylene-diimino)-di-1- butanol. 3,579,586, Cl. 260-584.

Zoja, Giorgio, to Laboratorio Chimico Farmaceutico Giorgio Zoja S.p.A.Process for the preparation of the dextrorotatory 2,2'-(ethylene-diimino)-di-1-butanol. 3,579,587, Cl. 260-584.

Zuckerman, Joseph L.: *See—*
Herz, Jack L.; Levy, Alan J.; Litt, Morton H.; and Zuckerman, Joseph L.,3,579,630.

Zutkis, Joseph A.: *See—*
Keating, John F.; and Zutkis, Joseph A.,3,579,102.

Zwicker, Walter K.: *See—*
Schjolberg, Eiler; Zwicker, Walter K.; and Milch, Alfred,3,579,359.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF MAY, 1971

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Alber, Norman E., and W. E. Smith, to Clevite Corporation. Extruding fibers having oxide skins. Re. 27,123, 5–18–71, Cl. 164—86.

Clevite Corporation: *See*—
Alber, Norman E., and Smith. Re. 27,123.

Erickson, Robert W., to The Regents of the University of Minnesota. Wood drying method. Re. 2,124, 5–18–71, Cl. 34—5.

Smith, Walter E.: *See*—
Alber, Norman E., and Smith. Re. 27,123.

University of Minnesota, The Regents of the: *See*—
Erickson, Robert W. Re. 2,124.

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Alaska, St. Barth. Hand magnifier. 220,724, 5–18–71. Cl. D57—1.

Artz, Kenneth W., to W. R. Grace & Co. Combined packaging tray and cover. 220,749, 5–18–71, Cl. D9—185.

Artz, Kenneth W., to W. R. Grace & Co. Combined packaging tray and cover. 220,750, 5–18–71, Cl. D9—185.

Artz, Kenneth W., to W. R. Grace & Co. Combined packaging tray and cover. 220,751, 5–18–71, Cl. D9—219.

Artz, Kenneth W., to W. R. Grace & Co. Combined packaging tray and cover. 220,752, 5–18–71, Cl. D9—219.

Behring Corporation: *See*—
Evans, John M. 220,760.

Best, Melvin H., to Rain Bird Sprinkler Mfg. Corporation. Lawn sprinkler. 220,763, 5–17–71, Cl. D23—7.

Bio-Logics, Inc.: *See*—
Larson, Roger V. 220,740.

Broussard, Vernon P. Power train for sugar harvesters. 220,771, 5–18–71, Cl. D40—1.

Brunswick Corporation: *See*—
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Burger Chef Systems, Inc.: *See*—
Thomas, Donald J. 220,758.

Computer Transmission Corporation: *See*—
Ortega, Charles J., and Naff. 220,764.

Cowan, Murray L., to Textron Inc. Expansible end link for a bracelet or similar article. 220,776, 5–18–71, Cl. D45—4.

Dansk Designs, Ltd.: *See*—
Nield, Refsgaard. 220,712.
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Deadrick, James R., to Stewart-Warner Corporation. Stationary pull. 220,747, 5–18–71, Cl. D8—159.

D'Ercoli, Giacinto C.: *See*—
Jablonski, Edward R., and D'Ercoli. 220,778.

Dial, Lawton M., Jr., L. J. Grossheim, D. M. Schramme, and W. H. Zennecker, to Arthur Dooley and Son, Inc. Fire extinguisher housing. 220,762, 5–18–71, Cl. D16—2.

Dick, Ralph A.: *See*—
Hawkins, Harold V., Dick, and Wendel. 220,772.

Dilyard, Richard D., to Rubbermaid Incorporated. Covered beverage pitcher. 220,773, 5–18–71, Cl. D44—1.

Dooley, Arthur, and Son, Inc.: *See*—
Dial, Lawton M., Jr., Grossheim, Schramme, and Zennecker. 220,762.

Erkers, Arne. Handsaw. 220,677, 5–18–71, Cl. D8—96.

Evans, John M., to Behring Corporation. Modular home. 220,760, 5–18–71, Cl. D13—1.

Gandy, Aaron E. Photographic slide sorting rack. 220,786, 5–18–71, Cl. D61—1.

Garcia, Philip, to General Motors Corporation. Motor vehicle lamp lens. 220,777, 5–18–71, Cl. D48—32.

Garcia, Philip, to General Motors Corporation. Motor vehicle lamp lens. 220,779, 5–18–71, Cl. D48—32.

General Motors Corporation: *See*—
Garcia, Philip. 220,777.
Garcia, Philip. 220,779.

Goings, Harford E. Food service tray. 220,774, 5–18–71. Cl. D44—10.

Gomez, Claudio G. and F. Kvapil, to The National Cash Register Company. Cash register or similar article. 220,719, 5–18–71, Cl. D52—4.

Gorham, Herman H.: *See*—
Romanias, Gus, and Gorham. 220,765.

Gould, Jerome, to Johnson & Johnson. Bottle. 220,748, 5–18–71, Cl. D9—82.

Grace, W. R., & Co.: *See*—
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Artz, Kenneth W. 220,751.
Artz, Kenneth W. 220,752.

Grossheim, Louis J.: *See*—
Dial, Lawton M., Jr., Grossheim, Schramme, and Zennecker. 220,762.

Grote Manufacturing Company, The: *See*—
Newman, Charles J. 220,780.

Guodace, Ronald A., to International Silver Company. Spoon or similar article of flatware. 220,783, 5–18–71, Cl. D54—12.

Guthrie, James E. Friction type bottle cap remover. 220,744. 5–18–71, Cl. D8—18.

Haddaway, Klein K. Cosmetic case. 220,789, 5–18–71, Cl. D86—10.

Hamburger Hamlets, Inc.: *See*—
Lewis, Marilyn. 220,791.

Hawknis, Harold V., R. A. Dick, and J. Wendel. Puller. 220,772, 5–18–71, Cl. D41—1.

International Business Machines Corporation: *See*—
Kapper, Henry. 220,698.

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Jablonski, Edward R., and G. C. D'Ercoli, to McGraw-Edison Company. Luminaire. 220,778, 5–18–71, Cl. D48—31.

Jackson, Clarence E. Mobile lounge chair. 220,761, 5–18–71, D15—11.

Johnson & Johnson: *See*—
Gould, Jerome. 220,748.

Jordan, John H. Cocktail table. 220,768, 5–18–71. Cl. D33—14.

Kapper, Henry, to International Business Machines Corporation. Telephone terminal. 220,698, 5–18–71, Cl. D26—14.

King, Robert, to International Silver Company. Spoon or similar article of flatware. 220,784, 5–18–71, D54—12.

Kinnear Corporation: *See*—
Smith, Richard E. 220,757.

Kovacik, Stephen J., to Libbey-Owens-Ford Company. Glass cutting tool. 220,745, 5–18–71, Cl. D8—51.

Kvapil, Francesco: *See*—
Gomez, Claudio G. and Kvapil. 220,719.

LaHue, Paul D. Slidable golf ball for putting practice. 220,769, 5–18–71, Cl. D34—5.

Larson, Roger V., to Bio-Logics, Inc. Information plate for a hospital patient. 220,740, 5–18–71, Cl. D96—13.

Leisure Products Corporation: *See*—
Piazza, Joe E. 220,788.

Levin, Monte L., to Miner Industries, Inc. Balloon vending machine. 220,781, 5–18–71, Cl. D52—3.

Lewis, Marilyn, to Hamburger Hamlets, Inc. Sign panel. 220,791, 5–18–71, Cl. D96—12.

Libbey-Owens-Ford Company: *See*—
Kovacik, Stephen J. 220,745.

Lo Cascio, Jack J.: *See*—
Marcario, Joseph P., and Lo Cascio. 220,741.

Lokey, Robert C. Type soldering jig. 220,746, 5–18–71, Cl. D8—71.

Marcario, Joseph P., and J. J. Lo Cascio, to Sarong, Inc. Brassiere. 220,741, 5–18–71, Cl. D2—24.

Mazeika, Albert, to Milton Manufacturing Company, Inc. Portable battery tester. 220,782, 5–18–71, Cl. D52—6.

McGraw-Edison Company: *See*—
Jablonski, Edward R., and D'Ercoli. 220,778.

Miller, Phillip E. Standard for use in supporting horizontal bookshelves. 220,766, 5–18–71, Cl. D33—3.

Milton Manufacturing Company, Inc.: *See*—
Mazeika, Albert. 220,782.

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Levin, Monte L. 220,781.

Mohl, Edward H. Swim suit or similar article. 220,742, 5–18–71. Cl. D2—42.

Naff, Frederic L., Jr.: *See*—
Ortega, Charles J., and Naff. 220,764.

National Cash Register Company, The: *See*—
Gomez, Claudio G., and Kvapil. 220,719.

Neward, Theodore C. Goggles. 220,743, 5–18–71, Cl. D2—234.

Newman, Charles J., to The Grote Manufacturing Company. Automotive lamp. 220,780, 5–18–71, Cl. D48—32.

Nield, Refsgaard, to Dansk Designs, Ltd. Cup. 220,712, 5–18–71. Cl. D44—9.

Olivetti, Ing. C., & Co., S.p.A.: *See*—
Svezia, John. 220,787.

O'Neill, Frank D. Combined egg holder and opener, condiment dispensers and holder therefor and spoon holder. 220,775 5–18–71, Cl. D44—24

Ortega, Charles J., and F. L. Naff, Jr., to Computer Transmission Corporation. Housing for computer interface unit. 220,764, 5–18–71, Cl. D26—5.

Pallet, David M. Coin-holder and dispenser. 220,718, 5–18–71. Cl. D52—4.

Piazza, Joe E., to Leisure Products Corporation. Occupant-body-steerable self-propellable aquaplane or similar article. 220,788, 5–18–71. Cl. D71—1.

Power, Lawrence H. Instruction cubicle. 220,767, 5–18–71, Cl. D33—7.

Quistgaard, Jens H., to Dansk Designs, Ltd. Candelabra. 220,713, 5–18–71, Cl. D48—2.

Rain Bird Sprinkler Mfg. Corporation: *See*—
Best, Melvin H. 220,763.
Reid, Essie M. Combined cabinet and accessory tray unit. 220,706, 5–18–71, Cl. D33—19.
Renwick, William C., to Brunswick Corporation. Building or the like. 220,759, 5–18–71, Cl. D13—1.
Rives, William T. Identification tag blank. 220,790, 5–18–71, Cl. D96—3.
Romanias, Gus, and H. H. Gorham. Panel box for refrigerator control. 220,765, 5–18–71, Cl. D26—13.
Rubbermaid Incorporated: *See*—
Dilyard, Richard D. 220,773.
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Marcario, Joseph P., and Lo Cascio. 220,741.
Schramme, Donald M.: *See*—
Dial, Lawton M., Jr., Grossheim, Schramme, and Zennecker. 220,762.
Smith, Richard E., to Kinnear Corporation. Bottom rail for a roll-type door. 220,757, 5–18–71, Cl. D13—1.
Stewart-Warner Corporation: *See*—
Deadrick, James R. 220,747.
Stineman, James S. Air-supported structure. 220,685, 5–18–71, Cl. D13—1.
Stineman, James S. Air-supported structure. 220,686, 5–18–71, Cl. D13—1.
Svezia, John, to Ing. C. Olivetti & Co., S.p.A. Typewriter. 220,787, 5–18–71, Cl. D64—11.
Textron Inc.: *See*—
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Thomas, Donald J., to Burger Chef Systems, Inc. Building. 220,758, 5–18–71, Cl. D13—1.
Toffolon, Siro R., to International Silver Company. Spoon or silimar article of flatware. 220,785, 5–18–71, Cl. D54—12.
Townsend, Lynn R. Planter bowl. 220,770, 5–18–71, Cl. D35—1.
Traczyk, Raymond M.: *See*—
Zenger, Richard D., and Traczyk. 220,756.
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Zenger, Richard D., and R. M. Traczyk. Unit for dispensing liquid from a container. 220,756, 5–18–71, Cl. D9—290.
Zennecker, Walter H.: *See*—
Dial, Lawton M., Jr., Grossheim, Schramme, and Zennecker. 220,762.
Zundel, Arthur P. Container end. 220,753, 5–18–71, Cl. D9—253.
Zundel, Arthur P. Container end. 220,754, 5–18–71, Cl. D9—253.
Zundel, Arthur P. Container end. 220,755, 5–18–71, Cl. D9—253.

CLASSIFICATION OF PATENTS

ISSUED MAY 18, 1971

NOTE.—First number, class; second number, subclass; third number, patent number

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